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NOTICE TO AMERICAN READERS.

Complete series of the Journal may be had of Messrs. D. Appleton and Co., 200, Broadway, New York, to whom all subscriptions for the United States, after the 10th of January, 1851, must be paid.

NOTICES.

The subscription is 10s. per annum if paid in advance, or 12s. on credit, payable in two sums of 6s. each, due in June and December of each year. All subscriptions commence from the 10th of January.

All communications and orders for Advertisements to be addressed to the Editor, 32, Bucklersbury, London.

Back numbers exceeding three months' date will in future be charged double price, unless six or more consecutive numbers are taken at the same time. Nos. 6 and 18 are out of print.

The Editor will be particularly obliged by his friends forwarding to him Notices of all Meetings, Trials, or Appeals which it may be interesting to the Gas World to have reported.

Circular to Gas Companies.

The Editor may be consulted on all subjects connected with the supply and manufacture of gas, or the alteration and improvement of gas apparatus, and the construction of new works.

The first of May, 1851, is destined to be a memorable day in the world's future history. The thousands who witnessed the gorgeous pageant by which the "Exhibition of the Industry of All Nations" was that day inaugurated, will long retain the impression produced by its splendour and magnificence; but the impulse and tone which it must communicate to the future relations of the various nations of the world with each other, will not cease with the present generation; and in after ages some future Macaulay and Gibbon will chronicle the event in their eloquent and philosophic pages with feelings which will raise its peaceful triumphs far above the sanguinary ones of Trafalgar and Waterloo. Indeed, a more touching example cannot be cited of the associations which such a spectacle produces, than the presence of the illustrious hero of a hundred fights, inaugurating the eighty-second anniversary of his birth, by joining in the pageant, his tottering steps supported by the arm of all that Napoleon's cannon have left of his gallant companion, the veteran Anglesey, preceded by the apostle of peace in citizen garb, and followed by the Sovereign of these realms in regal pomp and state, consecrating, by her presence, that principle of peaceful strife between nations, the tendency of which must be to turn their swords into plough-shares, and their spears into pruning-hooks. Such a spectacle the world never before witnessed, and the present generation may never witness the like again.

We purpose at a future period giving a detailed description of the principal articles exhibited relating to our particular department of the arts and manufactures. The following outline, sketched on a cursory survey, will, in the meantime, suffice to draw attention to the most interesting of them.

In the mining and mineral departments we find numerous specimens of coals, cannels, and fire-clay. Scotland is worthily represented by her Boghead, Capeldrae, and Wemyss cannels, out of a block of the latter of which an elegant sofa has been carved, the property of her Majesty. England contributes specimens of Ramsay's and Cowen's Newcastle cannels, Ince Hall cannel from Wigan, and numerous others of the gas coals, including Pelton, Heworth, Pelaw, Ravensworth Pelaw, and Felling, all from the Newcastle field; Silkstone and Barnsley from the Yorkshire, Butterley from the Derbyshire, Brymbo from the North Wales, and others from Bristol and South Wales. There are also several foreign and colonial specimens, among which we remarked some from Cape Breton (America), New Zealand, Spain, Belgium, Mülheim and the Rühr in Prussia, and from the United States, the latter including some cannels apparently of good quality.

The same department also contains specimens of fire-clay from Messrs. King and Co., Stourbridge; Pease and Co., Darlington; G. H. Ramsay, and J. Cowen and Co., Newcastle-on-Tyne. The latter exhibit a fine block, weighing about 15 cwt., of remarkable purity. There is also a fine specimen in the Prussian department.

Passing to the department of manufactures in mineral substances, we remarked specimens of the workmanship of all the exhibitors of fire-clay. Messrs. J. Cowen and Co. have two gas retorts which will bear comparison with any foreign ones, and appeared to us to be the most perfect examples of clay retorts ever produced in this country, so far as workmanship is concerned; and, should any prize be awarded in this department, the makers will, we apprehend, stand a good chance of carrying it off. Mr. Ramsay has a very creditable specimen of his skill in this manufacture; and Mr. Potter one which, from its position, it is impossible to examine closely, but seen from a distance it does not appear to approach its rivals. The other English exhibitors of fire goods are Messrs. Harpers and Moore, Rufford, and Hickman and Co., all of Stourbridge; but their specimens consist principally of bricks, tiles, and pots for glass and chemical manufactures. Mr. Rufford's glazed bath is an excellent example of its kind.

In the Belgian department, M. Tilboucher, of Baudour, has a clay retort which is not disgraced by its British rivals. It is apparently sound, well shaped, and thinner than any other in the collection. Messrs. Pastor Bertrand and Co., of Ardenne, have also a good specimen of a clay retort, and an assortment of fire-bricks and lumps.

A retort contributed by Mons. A. Pauwels to the French department is yet unpacked; and there are probably other contributions in the foreign section similarly circumstanced.

Messrs. D. Y. Stewart and Co., of Glasgow, exhibit one of the 4500 patent cast-iron pipes, 44 inches diameter, and 12 feet long, made by them for the Liverpool Corporation Water Works; and Messrs. Losh, Wilson, and Bell, of Newcastle, a remarkably light pipe, 36 inches diameter, and only ¼ inch thick, moulded by machinery and manufactured by them under Stewart's patent. There are also specimens of Chameroy's sheet-iron pipes coated with asphalte, an invention which the low

price of cast-iron pipes renders of little utility in this country.

Mr. Holliday exhibits samples of the sulphate, muriate, and carbonate of ammonia, produced from the liquor of the Sheffield Gas Works, and the Bituminous Shale Company specimens of their products. All these products, as well as others from peat, deserve to be remarked.

The English general hardware department contains a considerable collection of gas fittings, stoves, cooking apparatus, &c., but nothing very remarkable either for its novelty or beauty of design. Mr. G. B. Lloyd, jun., of Birmingham, and Messrs. Cowley and James, of Walsall, exhibit respectable specimens of wrought-iron tubing, but that of Messrs. Gandillot and Co., of Paris, is at the head of its department. The Motala Iron Works, in Sweden, have also a very creditable specimen, but the Austrian contribution is so inferior as not to bear comparison with any of them.

Mr. James Nayler, of Hulme, Manchester, exhibits cheap globe lanterns for street-lights, the chief novelty of which consists in the adaptation of a gauze disc to the aperture in the bottom through which the burner is introduced. Messrs. Kepp and Co. have substantial models of copper lanterns, and Mr. J. F. Sarson, of Leicester, one for which some improvement in its ventilation is claimed, but, though we are unable to discover in what it consists, some of our readers may be more fortunate.

Of gas meters there is a good show. Messrs. Shears and Son have contributed a tastefully-executed glass working model of their dry meter; Mr. Defries the same. Mr. Edge and Mr. Glover have also sent specimens of their dry meters, and the latter maker has provided the one by which all the gas consumed within the building is registered. In wet meters we remarked contributions from Messrs. Cochran and Co. (Edinburgh), Mr. C. Botten, Messrs. Paddon and Ford, Mr. Edge (London), and Messrs. Bott and Allen, of Manchester.

In burners there are specimens of Mr. Biddle's self-adjusting one, as well as others from Messrs. Young, Clark, and Leslie, with all of which our readers are too well acquainted to require any further notice here.

In gas fittings Birmingham has made considerable progress, both in design and in lacquering and gilding. The large chandelier of Mr. Winfield is a graceful composition, and one of which the designer may be proud. Lacarrière, of Paris, too, has some elegant designs in chandeliers and brackets, but the two former manufactured by Cornelius and Co., of Philadelphia, are the most remarkable in this branch of industry, and at the same time the most creditable of all the specimens of American manufactures in their department of the Exhibition. Messrs. Haldane and Roe, of Edinburgh, Mr. Hughes and Mr. Clark, of London, with Mr. Potts, and Messrs. Messenger and Son, of Birmingham, are exhibitors. Several massive candelabra from Maestricht, in Holland, will be found in that division, and in them glass and metal are judiciously combined, and the effect produced light and pleasing. Two Russian candelabra, gilt, and a German one in bronze, attract considerable attention, and may afford hints for works of less gigantic proportions.

The peculiarities of the gas stoves and cooking apparatus will each require to be hereafter detailed. The former includes contributions from Messrs. Lamb (Sunderland), Ricketts, Strode, Defries, Huxley, and Heriot. The latter from Messrs. D. Grant, Ricketts, Strode, Defries, and Warriner, whose oven is made out of fire-clay, and in this respect differs from its competitors.

In apparatus for the other domestic and minor uses of gas we note one for melting wax and tallow by Mr. Defries; Coffey and Smith's beautiful miniature still; Dr. Hofmann's testing jet; and Beale's gas experimental furnace for laboratory use.

The contributions of other exhibitors may perhaps have escaped our observation and research, in which we are but little aided by the catalogue in its present imperfect state: some of the objects there enumerated are not to be found, and, on the other hand, the observer constantly stumbles over others of which no record appears in the official list. This will doubtless be remedied in a subsequent edition, and our next notice will be more complete.

Our readers will find in another column a report of the last general meeting of the shareholders of the Great Central Gas Consumers' Company, held on the 30th ult. More than ordinary precautions appear to have been taken to prolong the period when an exposure must take place of the disgraceful system of slander and misrepresentation upon which this concern has been founded, and before which its concoctors evidently recoil. The daily press are invited to chronicle the falsehoods and calumnies which are unscrupulously dealt out at each of these meetings, without any opportunity of contradiction being afforded to the slandered; but the instant a solitary shareholder, from whom an awkward inquiry is anticipated, makes his appearance, the "door is barred and bolted" against the intruder, under a provision of the deed of partnership by which the directors claim a veto upon the registration of all transfers. The shareholder excluded in this case is well known to be a man of unblemished honour and probity, and one who, by industry and frugality in his calling as a gasfitter, has saved a considerable fortune, of which upwards of £20,000 is invested in the shares of numerous gas companies. Such a man would be a tower of strength to most concerns, and his exclusion from the one under consideration will do more to damage it in public estimation than a catechism of questions put at a general meeting, for which an astute chairman is generally prepared with snubbing answers, suited to the temper and character of the majority of his audience. Unable to obtain the information he required in the usual manner, the gentleman in question has publicly addressed the following letter to the chairman of the Great Central Company:—

"*Thomas Dakin, Esq., Chairman of the Great Central Gas Consumers' Company.*

"Sir,—With reference to our conversation at the London Tavern, on the 30th ult., when I demanded admission to the meeting of shareholders of the Great Central Gas Consumers' Company, of which I am one, and was refused, I beg to say that, so long ago as March, 1849, I was invited to become a proprietor of the company by the then chairman, Mr. Charles Pearson (one of your present honorary directors), who told me on Tuesday, in your presence, and that of the other directors, that he had a cloudy recollection of the fact. It was well known then as it is now, to Mr. Pearson and others, that I am a large gas proprietor, having shares in many of the metropolitan companies, and, being practically acquainted with the subject in its details, take much interest in it. The investments which I have made in that species of property have not averaged 5 per cent., and recently I have been without any dividend upon a portion of my property invested, and for the rest have received a reduced dividend. Hearing that the Great Central Gas Consumers' Company was to pay 10 per cent., I naturally wished to avail myself of so beneficial a change; but it is my habit, before I embark extensively in any trade or partnership, to endeavour to make myself acquainted with its real position. I have suffered considerably from exaggerated statements of profits by companies, no doubt meaning to act correctly, but, unfortunately, not distinguishing sufficiently in the accounts between capital and profit. In one company, upon investigation, it was discovered that £29,000 of dividend had been improperly paid out of capital, and, in consequence, our dividends were suspended for two years, and the shares fell from £50 to £20 per share. I am, therefore, now rather more cautious than ever in crediting the flourishing statements made by companies just starting; but if, on investigation, I should find that your flourishing statements are likely to be borne out by fact, I would certainly avail myself of Mr. Pearson's invitation and take more shares.

"I intended to have asked at the meeting two or three questions which, from the known fairness and courtesy of your character, I have no doubt you would have responded to as a straightforward man. I will make no further excuse for asking them by letter than my being prevented from putting them to you personally at the meeting, and, if you can answer them satisfactorily, I am sure I shall have benefited your company by putting them.

"1. Have the accounts been arranged by a competent accountant as well as audited?

"2. Are the expenses of litigation and parliamentary contest, and all expenses since the complete registration of the company, carried to capital or revenue account?

"3. Is the cost of service and connection pipes, fittings, and meters, put down to capital or revenue account?

"4. Have the profits been received, out of which the proposed dividend is to be paid?

"5. What number of shares have been forfeited, and have the parties been sued for their calls?

"6. On what amount of capital is the proposed dividend to be paid?

"7. How is it that we are not supplying the 6000 consumers who contracted with the company before going to Parliament, and had all those who are now supplied so contracted?

"8. Why have any persons, and particularly Mr. Barlow (the gas engineer), been refused gas?

"9. How are the company to supply the public lights of the City?

"10 Has any new, and what, contract been made with Mr. Croll?

"11. What have Messrs. Rigby received, and what do they now claim?

"12. What has Mr. Chadwick received, and what does he now claim?

"13. What money has been borrowed, and from whom, and on what terms, and are the works mortgaged, and to whom, and for what amount?

"14. Is it true that Mr. Croll has transferred 1182 of his shares, leaving him possessed of only 220?

"15. Is it true that his late partner, Mr. Glover, has had all his shares (468) forfeited for non-payment of calls?

"16 And can the chairman say how many more shares have been forfeited beyond the 555 reported to the registrar of joint-stock companies?

"17. Is Mr. Bovil a director, and has he paid upon his 400 shares?

"I am, sir, your obedient servant,

"239, Tottenham-court-road, May 2, 1851. "WILLIAM PEARSE."

In his published reply Mr. Dakin, from the summit of his throne of gallipots, declines entering into correspondence with an individual so much beneath his dignity as a gasfitter is in-

sinuated to be, and flatly refuses to recognise the transfer to Mr. Pearse, tendering him, however, the cost of his share, with a premium, as the most convenient mode of getting rid of what he apprehends may turn out to be a troublesome shareholder. The fact, however, is too palpable to admit of any contradiction, that it was feared Mr. Pearse's inquiries and investigation would cause the bursting of the bubble earlier than was convenient; and it is hoped by a liberal outlay of venomous slander and abuse to protect for a short period its brilliant but unstable gyrations.

It will be in the recollection of all our readers that, when this company was projected, certain estimates of the cost of works capable of producing and distributing certain quantities of gas were put forth, to the accuracy of which we at the time objected, as well as to that of the estimates of the cost of gas. We asserted that, either the estimated capital required was of too low, or that the quantity of gas which a work constructed within the limits of that capital, would distribute, was calculated too high. Twelve months have scarcely elapsed since Mr. Croll submitted to a committee of the House of Commons his estimate No. 1, from which it appeared that, with an expenditure of capital amounting to £136,033. 15s., a yearly rental of £53,333. 6s. 8d. could be earned, arising from the sale of 266,666,667 feet of gas. This took place on the 13th of May, 1850. On the 30th of April, 1851, we find an acknowledged expenditure on the capital account to March 18 of £130,033; with an arbitration going on, in reference to the outstanding claims of the contractors, amounting to nearly £40,000 more, every item of which is fought with a pettifogging pertinacity absolutely disgraceful and ungenerous, when the services rendered to the company by the contractors are considered.

At the same time, and from the same source, we find that no profit whatever was realized upon the first quarter's workings; and that the rental for the second quarter, ending March 24, had amounted to £11,002, a sum which, supposing the gas rental of the four quarters of the year to be equal, would give a yearly one considerably inferior to that assumed by Mr. Croll in his estimate No. 1; but, taking into account the difference in the seasons, and that the £11,002 includes, we believe, three weeks prior to December 25, 1850, it is quite clear the actual yearly gas rental falls short of £30,000; and it is notorious that during the last winter the works were almost incredibly distressed to keep up the supply of the quantity of gas required to earn this rental, cannel coal and resin having been resorted to in large quantities on many occasions. We may, therefore, safely draw the conclusion from admitted facts, that £130,000 has been actually expended on capital account, that £40,000 more is claimed by contractors, and £10,000 required for further preliminary expenses, making together £180,000 of expenditure and liabilities to earn a rental of £30,000. All this the parties virtually admit by their notice that £70,000 more must be spent this year in further extensions of works; or, in other words, that enlarged works are required when the quantity of gas to be distributed exceeds 150,000,000 feet per annum. To say that the quantity now distributed amounts to 250,000,000 is a contradiction with the accounts, so far as they have been suffered to transpire, the real object for which the assertion is made being, apparently, to give some plausible reason for further demands upon the shareholders towards meeting the eventualities of the ensuing winter. It remains to be seen how the shareholders will respond to the appeal. A dividend had been promised to them at this meeting, and, as the parties boast that they never make a promise which they do not perform, a dividend must of course be declared, whether earned or not. Indeed we have a faint recollection that the engineer's remuneration was in some measure dependent upon 5 per cent. being paid the first year, and 10 per cent. the second; and this would be an additional inducement, in the absence of all others, for the promise being kept. It does not appear, however, that any audited profit and loss account was produced to the meeting, or anything beyond a rough estimate of the rental and expenses for "three months and three weeks" preceding March 24th. We shall be curious to see what sort of an account will be presented at the next half-yearly meeting of the shareholders, when the two summer quarters' earnings will be nearly absorbed by the current expenses of distribution. So long as the company purchase at the present rate, and the public are content to use, the mixture of gas and atmospheric air (see Mr. Dakin's address to the Court of Sewers in the present Journal) which they now occasionally—as they admit, but more constantly as many assert—supply to the public, till Coleman-street rings with complainants, they may possibly with propriety declare a moderate dividend. But *industrious exhausters* and *leaky retorts* soon tell tales on the vibrations of consumers' meters, and symptoms of dissatisfaction have already appeared. if we may judge from a list lately handed into the commissioners of sewers of numerous consumers who had abandoned the use of gas subject to such fluctuations in its quality.

We have already alluded to the arbitration now pending before Raikes Currie, Esq., M.P., upon the claims of the Messrs. Rigby on the Great Central Gas Company. Mr. Currie has called to his aid, as advisers upon engineering and legal questions, Joseph Locke, Esq., M.P., the eminent civil engineer, and a barrister. The parties have sat about twenty days, and the expenses already incurred are said to excede £2000. An incident happened at the sitting of the 6th inst. which opens the door to many observations, and may lead to important results. The company's counsel had called one of the directors to prove certain facts of no public interest, and on cross-examination this gentleman frankly admitted that without Messrs. Rigbys' aid the whole fabric would have fallen to the ground; that, by an interchange of checks never intended to be presented or paid, credits were given in the bankers' pass-book by which it was made to appear to the satisfaction of the commissioners of the Court of Sewers that £75,000 had been paid in cash into the bankers' hand. Various other circumstances came out from which it appeared that these gentlemen had otherwise stood in the gap, and rendered important services to the cause of their employers. To the inquiry "*whether he was aware of any connection existing between Mr. Charles Pearson and Mr. Croll,*" he unhesitatingly replied that "THEY WERE PARTNERS." If a bomb-shell had fallen among the party it could not have created greater confusion than did this admission of a fact which many suspected, and which, if true, explains the secret springs of the apparently disinterested part certain gentlemen have taken on this question. Mr. Croll immediately and indignantly denied it; the witness reaffirmed it, asserting that the board generally were well aware of the fact. Couriers were despatched in all directions requiring the presence of the leading men, and the sitting broke up in the midst of an agitation indicating the gravity of the incident. Some explanation was promised at a future hearing which is taking place while these lines are being penned; and if anything worth communicating transpires we shall add it in a postscript. The assertion acquires an importance, coming from the lips of a brother director, to which it would not otherwise be entitled, and, as Englishmen are jealous to a degree unknown to other nations, of the honour of public men, the solicitor of the city of London, the idolized Charles Pearson, who "eats the citizens' bread," and devotes all his energies to the citizens' service, cannot rest one hour under the stigma of having headed a movement in which he had other interests to serve than those of the citizens at large, without repudiating the accusation, if untrue, or by his silence acknowledging its truth. It matters little, morally, whether, as some hint, the wife of the gentleman named is the actual partner, or that, as others assert, instead of a share in the profits, the consideration is an annuity. In any shape, or under any form, or for the benefit of any near relative whatever, if the facts are as asserted, the public will denounce the whole as a job of the most odious and most disreputable character, concocted under plausible pretexts, ostensibly for the public benefit, but secretly combining the personal pecuniary aggrandizement of one at least of its leading characters. How far success will attend these combinations time will prove, but the fact that shares of the nominal value of £11,820 have already found their way in the register at Serjeants'-inn, from the ostensible contractor for making gas, to the coal-factor through whom coals are supplied, does not indicate any considerable amount of present prosperity, or augur favourably for the future. Confidently as the charge is made, we are, however, loth to credit it; we are unwilling to believe that a public man, filling a responsible situation, can be found in this country ready to prostitute his great talents in accepting any share or pecuniary interest in an operation which he professes to support on public grounds alone; and our only object in thus alluding to it is to procure, if possible, that disavowal, if untrue, which the public manner in which the charge is now made requires.

Our allusion to the importance of a cheap governor or regulator of pressure for houses and buildings lighted with gas, has brought under our notice one just registered by Mr. Glover, which embodies to a great extent the object we had in view in drawing attention to the subject. It can be applied in five minutes to the top of the meter, without any change or alteration in the fittings, at the moderate cost of 16s. (wholesale price) for a three-light regulator, and larger ones in proportion. We have tested one which has been fixed in our office, and its action hitherto has been perfect.

The negotiation for an amalgamation between the City of London and the Great Central Gas Company, although attempted to be renewed since our last, has been definitively broken off, and the correspondence has been printed, but is too voluminous to be transferred to our columns; those desirous of making themselves acquainted with its details may obtain copies of Mr. E. Wilson, bookseller, Royal Exchange.

Communicated Articles.

The press of other matter compels us to cede the place reserved for the continuation of Mr. Barlow's article to one of Dr. Fyfe's on the same subject.

REMARKS ON THE MODE OF ASCERTAINING THE ILLUMINATING POWER OF COAL GAS, AND ON THE COMPARATIVE VALUE OF COALS FOR THE PURPOSE OF ILLUMINATION.

BY ANDREW FYFE, Esq., M.D., F.R.S.E.,

Professor of Chemistry, King's College University, Aberdeen.

In a paper published in the first and sixth numbers of this Journal I gave the illuminating power of the gases procured from different varieties of coal, and the value of these coals for the purpose of illumination. I had at that time recourse alone to the chlorine test, and took the gas of Newcastle, procured from common English caking coal, as my standard of comparison, because it was inferior in value to the others, in regard not only to the quantity of gas obtained from the coal, but likewise to the value of the gas itself. The general results thus given were:—

Coals.	Gas from 1 Ton.	Durability. Jet 5 in.	Cond. by Chlorine.	Value of Gas.	Value of Coal.
English Caking -	8,000	40′	4·3	1·	1·
English Parrot -	9,500	42′	7·6	1·85	2·2
Scottish Parrot -	9,500	60′	15·0	5·22	6·2

Since the paper referred to was published, I have had numerous opportunities of examining other kinds of coals, both from England and Scotland, and of trying the quality of their gases, not only by the chlorine process, but likewise by the Bünsen photometer. With regard to the chlorine method, though it is rarely practised, yet I put the same confidence in it that I have all along done, with the exception of those cases in which the gas is rich in olefiant. When they are tested by the photometer they do not indicate the high illuminating power given to them by the chlorine process. This, however, is not the fault of the chlorine; it is because we have not yet arrived at the proper method of burning these gases, so as to get from them the amount of light that they would afford, were they properly consumed. This I think I have satisfactorily proved in a paper published in the ninth number of this Journal, and hence one value of the chlorine test; it shows that a gas is rich in olefiant, and may, therefore, be mixed advantageously with poorer gases.

With regard to the coals on which I have lately experimented, the following are the results, as indicated by the chlorine test:—

Coals.	Gas per Ton.	Durability.	Chlorine.	Value of Gas.	Value of Coal.
English Caking, Pelton	9,746	50	6·5	1·	1·
English Parrot, Wigan	10,500	42	7·6	0·97	1·04
Ditto ditto, Ramsay	9,746	63	12·5	2·4	2·4
Midlothian, average	10,000	60	13·	2·4	2·46
Lesmahago, do.	10,176	70	17·5	3·77	3·93
Wemyss - -	10,000	75	19·5	4·44	4·61
Kirkness - -	9,620	80	20·7	5·08	4·51
Boghead - -	14,800	88	27·	7·3	11·

Some of these coals were afterwards tried by the Bünsen photometer; but before giving the results I shall advert to the methods now practised with it, all of which, with one exception, are, in my opinion, fallacious.

It is evident that, in using the photometer, we must have some uniform source of light with which the light of gas can be compared, and this source of light ought, by general consent, to be adopted. My attention has been repeatedly drawn to this, and I have accordingly performed numerous experiments with oils, tallow, and other substances, burning them in various ways; but from none did I get satisfactory results; I was, therefore, obliged to have recourse to candles, using those of sperm and wax as the most steady in their combustion. In this part of the inquiry difficulties were encountered which led to an investigation into the illuminating power of these candles. Some have imagined that the light afforded by them depends in a great measure on their size; the larger the candle the greater the light. This is not the case. Others have supposed that, whatever may be the size of the candle, the light is in proportion to the consumpt; the greater the consumpt the greater the light. This also is incorrect, as the following trials will show.

In conducting these trials I have had recourse to the different kinds of wax and sperm candles generally found in the market. The source of light with which I compared them was that of a small gas jet, kept burning steadily under the same pressure, consequently at the same length of flame, by which it emitted always the same amount of light. Each of the experiments was an hour in duration. The loss of weight was noted every ten minutes, so as to show the rate of consumpt and the total loss per hour. The comparative light *by the candle* is given, and also the comparative light *by the combustion of* 100 *grains* by each candle. In all the light of the gas jet is taken as 1.

Wax 8 to lb. 0·8 of in. diam.		Wax 6 to lb. 0·85 of inch.		Wax 3 to lb. 1 inch.		Wax 4 to lb. 0·9 inch.		Wax coach light. 1·25 inch.	
2·	loss	6·	loss	1·40	loss	1·20	loss	7	loss
2·10	20	6·10	18	50	20	30	27	10	28
20	26	20	20	2	24	40	29	20	30
30	25	30	26	2·10	25	50	26	30	28
40	23	40	22	20	22	2	24	40	28
50	26	50	16	30	24	10	26	50	29
60	25	60	21	40	21	20	26	60	35
60	145	60	123	60	136	60	158	60	178
Lht. of cand. 1·39 of 100 grs. 0·95		Candle 0·89 100 grains 0·73		Candle 1·08 100 grains 0·80		Candle 1·38 100 grains 0·88		Candle 1·10 100 grains 0·62	

Of these trials, six to the pound and the coach light were very unsteady in their burning, and, consequently, in the light afforded. Eight to the pound and four to the pound were much more steady. Eight to the pound was by far the best, not only with regard to the amount of light, but also to the equality of light during the continuance of the trial.

Sperm 8 to lb. 0·8 of inch diam.		Sperm 6 to lb. 0.85 of inch.		Sperm 4 to lb. 0·9 of inch.		Sperm 2 to lb. 1·15 of inch.	
5	loss	5 20	loss	6	loss	7·5	loss
10	27	30	24	10	30	15	30
20	23	40	24	20	28	25	27
30	23	50	22	30	29	35	33
40	22	6·0	24	40	25	45	35
50	23	10	27	50	25	55	35
60	22	20	26	60	25	65	34
60	140	60	147	60	162	60	194
Candle 100 grains	1·17 0·84	Candle 100 grains	1·44 0.98	Candle 100 grains	1·26 0·78	Candle 100 grains	1·47 0·77

Of these trials, eight to the pound gave a steady light, but the light for the consumpt was small. With four to the pound and two to the pound the light was not only trifling, but it was unsteady. Six to the pound was by far the best: it resembled very much wax eight to the pound, both as regard to amount and to steadiness of the light.

General results. Light compared with gas jet = 1, omitting the coach candle.

Light of Candles.		Light of 100 grains.	Comp. light.
Wax 6 to lb.	0·89	·73	1·
Sperm 2 to lb.	1·47	·77	1·05
Sperm 4 to lb.	1·26	·78	1·06
Wax 3 to lb.	1·08	·80	1·09
Sperm 8 to lb.	1·17	·84	1·14
Wax 8 to lb.	1·39	·95	1·30
Sperm 6 to lb.	1·44	·98	1·33

Contrast between two candles, one allowed to burn without being snuffed, the other snuffed occasionally:—

Candle not snuffed	6· 0′,	light = 1.	Candle snuffed, light = 1·
	6·10		wick long-light 1·22.
	20		wick bent . 1·32.
	30		do. . 1·10.
	40		just snuffed 1·

These experiments confirm what I have above stated, that not only is the light afforded by different candles different, but also that it is not always in proportion to the consumpt of inflammable matter. Much depends on the wick. It is evident, therefore, that, in wishing to have a source of light as uniform as possible, we must

fix on a kind of candle which, by previous trials, not only burns steadily, but also gives forth the greatest light for the consumpt. I have said that I prefer wax eight to the pound, or sperm six to the pound. In fixing the illuminating power of gases, they may be referred to that of candles, or, which I would prefer, to that of the combustion of a certain number of grains of wax or of sperm. * The latter is the more scientific; the former, most probably, will be preferred by engineers, as the most likely to be intelligible to consumers. Having fixed on a standard candle, the next thing to be considered is the proper method of ascertaining the light of the gas when compared with that of the candle. Different methods have been recommended by different individuals, all of which, with one exception, are, in my opinion, inaccurate.

It is proposed by some to cause the gas to be so burned that it shall give forth the same light as that of the candle, and then to ascertain the quantity of gas consumed. I need scarcely say that this method is very fallacious. From the small quantity of gas required, it is not properly consumed; accordingly, when instead of one candle several are used at the same time, and the gas is made to yield the same light, the light afforded for the same consumpt is much greater; but, again, the use of several candles is objectionable, from their proximity to each other, causing them to be melted. A second method is to contrast one gas with another, sometimes by making them give the same light, and then measuring the consumpt; at other times by consuming the same quantity of gas, and finding the light afforded. I consider this method also very fallacious. As it is frequently resorted to by contending parties, I am anxious to show its inaccuracy, by giving in detail the results of numerous trials made in this way.

The first set of experiments was made with gas from Pelton and from Wigan coal. The burners used were a London two-ringed fish-tail, a common large batswing, a London argand, with a button to spread out the flame, and an Aberdeen argand of similar construction. These were made to consume different quantities of gas according to circumstances. The burners were placed at the distance of eight feet apart. The Bünsen screen was sometimes placed midway, sometimes nearer to one burner than to the other, according to the light.

1.—Pelton gas, L. arg., 4·5 feet per hour. Photometer midway. Pelton gas, fish-tail, 3 feet per hour.
3 : 4·5 :: 100 : 150 P. 100 P. 150

This shows the difference in the illuminating power of the same gas according, to the kind of burner and the quantity consumed.

2.—Pelton coal gas, L. arg., 6·5 feet. Wigan coal gas, fish-tail, 3 feet.
60·5 inches to photometer 35·5 inches.
Sq. 35·5 : sq. 60·5 :: 100 : 290 | 6·5 : 3 :: 290 : 133
For equal consumpts—Wigan 100, Pelton 133.

3.—Pelton, A. arg., 5·2 feet. Wigan coal, fish-tail, 3 feet.
58 inches to photometer 38 inches.
Sq. 38 : sq. 48 :: 100 : 232 | 5·2 : 3 :: 232 : 133 —W. 100, P. 133.

4.—P., fish-tail, 3 feet. W., fish-tail, 3 feet.
Photometer midway.

In the second and third trials the Wigan gas was not properly consumed. In the fourth the Wigan gave a greater light as compared to that of the Pelton in the other trials.

5.—P., A. arg., 5·3 feet. W., L. arg., 6 feet.
43 inches to photometer 53 inches.
Sq. 43 : sq. 53 :: 100 : 151 | 6 : 5·3 :: 151 : 133—P. 100, W. 133.
In this the Wigan is profitably consumed.

6.—P., L. arg., 6·5 feet. W., A. arg., 5 feet.
49·2 inches to photometer 46·8 inches.
Sq. 46·8 : sq. 49·2 :: 100 : 110 | 6·5 : 5 :: 105 : 91 |
91 : 100 :: 100 : 110

In this I conceive that both gases were burning advantageously. If so, P. 100 : W. 110.

7.—P., L. arg., 6 feet. W., A. arg., 5 feet.
45 inches to photometer 51 inches.
Sq. 45 : sq. 51 :: 100 : 128 | 5 : 6 :: 128 : 153—P. 100, W. 153.

In this case the Pelton gas was not so advantageously burned as in the preceding. The gas was in too small quantity for L. argand.

Taking the illuminating power of the Pelton gas as 100, the preceding trials give that of the Wigan gas as 75—100—110 and 153, proving that by this mode of proceeding no confidence whatever can be placed in the results, as it is impossible to say in which particular trial both gases are properly consumed. The same conclusion must be drawn from the following series of experiments. The method practised was exactly the same, substituting for the Wigan gas that obtained from Ramsay's Newcastle Parrot coal.

1.—Pelton gas, batswing, 4 feet per hour. Photometer midway. Ramsay gas, fish-tail, 3 feet.
3 : 4 :: 100 : 133—Pelton 100, Ramsay 133.

2.—P., batswing, 3·7 feet. Photometer midway. R., fishtail, 2·5 feet.
2·5 : 3·7 :: 100 : 148—P. 100, R. 148.

3.—P., batswing, 6 feet. R., fish-tail, 3 feet.
53 inches to photometer 43 inches.
Sq. 43 : sq. 53 :: 100 : 151—6 : 3 :: 151 : 75·5 |
75·5 : 100 :: 100 : 133·4

4.—P., fish-tail, 3 feet. R., batswing, 3·6 feet.
31·75 inches. to photometer 64·25 inches.
Sq. 31·75 : 64·25 :: 100 : 409 | 3·6 : 3 :: 409 : 340—P. 100, R. 340.

In the first three of these trials the Ramsay gas seems to have been burned advantageously. In the first and third the Pelton gas was also properly burned; but apparently not so in the second; the quantity seems to have been too small. In the fourth the Ramsay gas was properly burned, but the Pelton gas was the reverse. The fish-tail does not appear to be a good burner for consuming it.

5.—Pelton, L. arg., 7·6 feet. Ramsay, A. arg., 4·5 feet.
50·25 inches to photometer 45·75 inches.
Sq. 45·75 : sq. 50·25 :: 100 : 120·7 | 7·6 : 4·5 :: 120·7 : 71·4
71·4 : 100 :: 100 : 140 | P. 100, R. 140.

6.—P., L. arg., 6·7 feet. R., A. arg., 4·2 feet.
Photometer midway—4·2 : 6·7 :: 100 : 160—P. 100, R. 160.

7.—P., L. arg., 6·4 feet. R., A. arg., 3·8 feet.
Photometer midway—3·2 : 6·4 :: 100 : 168—P. 100, R. 168.

8.—P., L. arg., 5·8 feet. R., A. arg., 3·5 feet.
Photometer midway—3·5 : 5·8 :: 100 : 165—P. 100, R. 165.

9.—P., A. arg., 6 feet. R., L. arg., 5·8 feet.
45 inches to photometer 51 inches.
Sq. 45 : sq. 51 :: 100 : 128 | 5·8 : 6 :: 128 : 132—P. 100, R. 132.

10.—P, A. arg., 6 feet. R., L. arg., 5·1 feet.
Photometer midway—5·1 : 6 :: 100 : 127—P. 100, R. 127.

11.—P., A. arg., 5·6 feet. R., 4·4 feet.
Photometer midway—4·4 : 5·6 :: 100 : 127—P. 100, R. 127.

12.—P., A. arg., 5·6 feet. R., fish-tail, 3 feet.
52 inches to photometer 44 inches.
Sq. 44 : sq. 52 :: 100 : 139 | 5 6 : 3 :: 139 : 74·4 |
74·4 : 100 :: 100 : 134—P. 100, R. 134.

In these last trials, taking the illuminating power of the Pelton gas, as before, as 100, that of the Ramsay varies from 127 to 168, still further proving the inaccuracy of the method practised.

The other method of trying the illuminating power, and where a photometer is to be used, the only one, in my opinion, that ought to be relied on, is to contrast the light of the gas with that of the standard light, using different burners, and consuming different quantities of gas, to procure the most profitable consumpt. The *average of the best results* may be considered as the illuminating power, contrasted either with that of any of the candles used, or with that given by the combustion of so many grains of wax in the same time. The following are the results of the trials made with the three gases used in the preceding trials. All the experiments are given with a view of showing the necessity of trying, not only different burners, but also different quantities of the same gas, with the same burner. The burners used were the London and Aberdeen argands previously referred to. The candle was a sperm six to the pound, burning 140 grains per hour.

Coal.	Burner. Feet per hour.		Light of Candles per foot.	Light of grains of Sperm.*
Pelton	L. Argand ...	7·	2·3	328·0
		7·5	3·1	434·0
	A. Argand ...	5.5	3·09	432·6
		5·5	3·18	445 2
		5·5	3·79	530·6
		5·5	3·5	490·0
		6·	3·4	476·0
	Average of six best		3·4	468·
Wigan	L. Argand ...	6·	2·52	352·8
		6·	2·66	372·4
	A. Argand ...	5·	3·28	459 2
			4·36	610·4
	Averge of two best		3·82	534·8
Ramsay	L. Argand ...	6·	4·1	574·
	A. Argand ...	3·8	3·3	462·
		4·7	5·0	700·
		4·7	5·1	714·
	Average of best		5·05	707·

I have performed similar trials with other coals, using the same burners and the same kind of candle. The following tabular view of the results shows the illuminating power of the gases; and, taking the quantity of gas afforded by the coals also into account, shows also the comparative value of the coals for the purpose of illumination, by the combustion of their gases. The three gases above

* I am glad to find that this method has been recommended by Mr. Barlow in the last number of the Journal, which reached me after the above remarks were drawn up to be alluded to at the Scottish Society of Arts on the 14th of April.

* By this column is meant that one foot of gas, burning for one hour, gives the light of so many grains of sperm consumed in the same time.

mentioned are also included. The value of the other products of decomposition is not taken into account.

Coals.	Gas per Ton.	1 ft. = Candles.	1 ft. = Gr. Sp.	Value of Gases.	Value of Coals.
English Caking, Pelton	9,746	3·4	468	100	100·
Wigan Parrot	10,500	3·8	535	114	122·8
Newcastle ditto, Ramsay's	9,746	5·05	707	151	151·
Average Lesmahago ...	10,176	7 5	1050	224	233 8
Boghead Parrot ...	14,800	7 7	1078	230	349·

Before concluding these remarks I would again urge upon those engaged in similar investigations the absolute necessity, when they wish to ascertain the illuminating power of a coal gas, of having recourse to the use of different kinds of burners, to discover which is best adapted to the gas under consideration; and also to use it with different quantities of gas, to find the most profitable consumpt. Having done this, the light given by the burner is then to be contrasted with that given by the standard candle previously fixed on, the consumpt of which per hour has been previously ascertained, so that the light of the gasburner may be compared with that of a certain number of grains of wax or of sperm.

Some may object to this method, on the ground that, as argands are very rarely used, consumers who use batswings or fish-tails do not get the light from the gas that they are told it affords. Allowing the force of the objection, perhaps it would be well to have recourse to batswing burners, provided gas engineers would, by common consent, agree to do so; or, which might be preferable, the illuminating power of a gas might be given, when it is consumed by different burners, as by a jet with five-inch flame, by fish-tail, by batswing, and by argand; and thus the consumer, knowing the value of the gas he is consuming, would find that he is really getting the light stated, according to the kind of burner he uses.

PROVINCIAL NOTES.

GREENOCK.

Gas affairs in towns where the supply of the article is in the hands of public authorities sometimes give rise to as much ill blood and hard words as they do where "monopolizing companies," as they are termed in the language of the day, have occupied the ground. We are aware that the tide of popular feeling runs strongly in favour of the trade in gas being carried on by public authorities, and that in most towns where that system is adopted the shopkeeper cheerfully pays 10 per cent. more for his gas than his fellow-tradesman in an adjoining town pays grumblingly for the same article to a trading company. But this feeling is not universal, and Greenock is an instance where one party repudiates the idea of making the supply of gas the medium of taxation, or, in other words, the laying upon the gas consumer of burdens which should be borne by the inhabitants at large. The two parties were brought into collision at a late meeting of the commissioners, at which the following report was made by the committee to whom the subject had been referred:—

"After fully considering the whole subject, and calculating as to the probable amount of the revenue and expenditure for the year from May, 1851, the committee have unanimously come to the following resolution, viz.:—That the price of gas shall be reduced from six shillings and threepence to five shillings and tenpence per thousand cubic feet; and that the following rates of discount to consumers shall be allowed from and after the 25th of May, 1851, viz.:—

£1 and under	£10	..	..	..	2½	per cent.
10 ..	30	..	..	..	5	..
30 ..	60	..	..	..	7½	..
60 ..	100	..	..	..	10	..
100 ..	150	..	..	..	15	..
150 and upwards		..	..	..	20	..

No discount on sums under £1."

The reductions proposed did not come up to the requirements of the anti-gas taxation system party; but, after an angry discussion, the recommendation of the committee was confirmed. Some ill-natured and, if we may judge from the documents which follow, uncalled-for remarks upon the management have provoked a spirited reply from the late Provost (or mayor, as we say in the south), the greater portion of which, and the accounts which accompany it, we transfer to our pages, as affording the clearest and most lucid statements which have hitherto appeared in print of the rise, progress, and present position of any gas work. The most remarkable point is the extraordinarily low per centage to which the leakage is reduced; and we should not be surprised if Greenock becomes a centre of attraction to gas engineers anxious to see for themselves how such a phenomenon is produced.

The documents are subjoined:—

"TO THE PROVOST, MAGISTRATES, TOWN COUNCIL, AND WATER TRUSTEES OF GREENOCK.

"Gentlemen,—Although no longer resident in Greenock, I cannot but feel that interest in her affairs, which every citizen who has mingled in her local politics must naturally entertain; and if there is any branch of the town affairs in which I have taken a deeper interest than another, it is your Gas manufactory, the success of which is so closely connected with the prosperity of the Town Trusts. I may be, therefore, excused if I extend my observation of the proceedings of your members beyond the period of my official connexion with your body, and offer a few remarks on a late discussion as to the Gas-works.

"Certain members of the Gas Committee, I suppose by way of administering a cordial to their vanity, are in the constant practice of indulging, to a most ludicrous extent, in bombast and self-glorification on every matter connected with the Gas-works. The meeting of Water Trustees, on the 18th of March last, seems to have been quite a field-day with these gentlemen; for, besides the customary display of egotism and self-laudation, they favoured their audience with a variety of observations more than usually fulsome and offensive. That these gentlemen, equally with the other members of the Gas Committee, are zealous and attentive to the interest of the works, I do not for a moment doubt; but, on the other hand, I consider that it would not detract from their merits, nor would their services be less likely to be appreciated, were they frankly to allow that their predecessors had been equally useful and equally earnest in the discharge of their duties with themselves. What I have to complain of is, that the gentlemen alluded to arrogate the whole honour to themselves, and will give none of it to the person to whom I allege the honour, if honour there be, exclusively belongs, of having rescued the Gas-works from confusion and ruin; for I affirm that Father Gavazzi, the Italian refugee, has as much ground to plume himself upon the prosperous condition of the Gas-works as either the present or the former committees; and that the entire credit is due to that much abused, but most faithful public servant and public benefactor, the present Manager of the Gas-works.

I maintain, then, and now offer to prove, that had it not been for the able and active management of the manufacture and conduct of the affairs of the Gas-work by Mr. Alexander Ritchie, and the great extensions and improvements so judiciously recommended by him, and so wisely adopted by those in the management at the time of his appointment, these works could not now have been in the position they are; and not only would there have been nothing to bonst of regarding them, but the very reverse would have been the case. As well might the Prussians boast that they, and not British valour and British blood, had won the Battle of Waterloo, as may Messrs. William Allison and Hew M'Ilwraith brag that their checking of extravagance, and doing this and that in the management, have been the cause of the great prosperity and large profits now happily realized from the Gas-works.

"Mr. M'Ilwraith, indeed, knowing that his assertions by themselves would be taken just at what they were worth, tries to bring figures to his aid, and by way of 'showing that the community got more profit from the works when the capital was less than half its present amount,' gives the capital and *net profits* divided, for each year from 1840 to 1847; while he most unfairly keeps out of view the *price of gas*, the *quantity* made, the *gross revenue*, the *amount of interest*, and the *money laid out in extensions of the works* at each of these periods. Had he been honest enough to publish these particulars, the question would have assumed a very different aspect; for had the price of gas remained the same during the latter series of years as it had been during the former, what would the profit have been? Or had the price been in 1839 the same as it is at present, would there have been any profit at all? I leave Mr. M'Ilwraith to answer these questions. Though the increased capital, therefore, may not have proportionally increased the profits, it has, at all events, left a large sum to fructify in the pockets of the community from the diminished price; the saving from that reduction averaging about £5,000 a-year for the last three years, as the following table will show:—

Cap	Gas Manufactured.	Price of Gas.	Net Revenue	Ordinary Expenditure, including Interest.	Gross Profits.	Paid out on Extensions and Reduction of Capital.	Profits Divided.	Gain to the Public by reduction of Price.	Cost of Coals per ton.
	£	s. d.	£	£	£	£	£	£	s. d.
1837	13,557	13,566,900	11 3	4785	4058	727	165	562	— 16 4
1838	13,557	15,685,000	11 3	4963	3865	1068	203	865	— 15 7
1839	13,557	17,534,000	11 3	5254	3561	1693	130	1563	— 13 5
1840	13,557	15,189,000	11 3	5719	3390	2329	456	1873	— 15 2
1841	13,557	13,058,000	10 0	5460	2957	2503	1000	1503	1812 15 7
1842	16,550	13,674,300	10 0	5854	3137	2717	784	1933	1040 16 7
1843	17,550	13,606,500	10 0	5560	3088	2462	502	1900	910 15 8
1844	18,550	14,377,500	10 0	5984	2952	3032	1032	2000	1170 15 6
1845	21,000	16,509,700	9 2	6501	3295	3206	1306	1900	1720 16 1
1846	23,000	21,410,000	8 4	7662	4440	3220	1620	1600	3400 16 5
1847	30,000	23,738,500	8 4	8367	5610	2757	1257	1500	3460 19 11
1848	30,000	24,526,500	7 6	8540	5940	2600	1100	1500	4100 20 6
1849	30,000	24,918,600	6 8	8346	5318	3028	1628	1500	5500 17 3
1850	28,550	26,256,000	6 8	8893	5014	3879	2380	1500	6000 13 3

"Before proceeding farther, I must advert to a statement made by Mr. Allison, that previous Committees had sacrificed various items which he enumerates, for the purpose of increasing Mr. Ritchie's commission. That certain facilities were given to the public, with the view of benefiting the works by the expected increase of consumption, I cannot deny; but that the promoters of these facilities had in view any such object as Mr. Allison asserts, is as absurd as it is unfounded, and no one knows this better than Mr. Allison himself. Mr. Allison knows that the chairmen of the various Gas Committees were utterly incapable of resorting to such pitiful shifts and miserable subterfuges to obtain so insignificant an end; and I can scarcely find words strong enough to express my contempt at the base insinuation, which could only emanate from a mind incapable of entertaining a generous sentiment. Every one agreed that Mr. Ritchie was well entitled to a better salary than he then enjoyed, and to accomplish that object, it was thought as well to offer him a small per centage on the amount, which was entirely the fruit of his own exertions and industry. Some, indeed, may suppose that a fixed salary was a preferable mode of payment; but the Committee thought otherwise, and I am still of the same mind as theirs. One thing is certain, that the made of payment did not influence Mr. Ritchie; for it is well known to every one who has been in the management that he was uniformly *the strongest advocate for reducing prices, and dividing as small a sum as the wants of the Trust would admit of*. For the three years, 1845, 1846, and 1847, the whole salaries amounted to £900, and for the three following years to £990. Does that look as if any unfair means had been used, or 'items had been sacrificed by former Committees for the purpose of increasing Mr. Ritchie's salary?'

"One of the means used by former committees to increase the consumption was the placing service pipes up staircases, and supplying meters gratis, an expense fully justified by the large profits then derived from the high price of gas. No doubt a difference of opinion may naturally exist as to the policy of this measure; but every one knows, and no one better than Mr. Allison, that the only object in view was, in the one case, to induce unwilling landlords to put the gas within reach of their tenants, and thereby increase the demand and the consumption; and, in the other case, to lessen the burden to small consumers, who felt the charge for loan of meters to be a disproportionate and unequal tax, the charge for the use of meters being at the time as high as 3s. annually. When the price of gas was reduced, and the profits consequently lessened, it may have been prudent in the late committee to alter the system; but upon what principle Mr. Allison makes a boast of 'saving' the sums received the two last years for meters and service pipes, I cannot comprehend. In my eyes, it was not economy that produced the *saving*, but simply the taking of so much money out of the consumers' pockets. As well might credit

have been taken for *saving*, if the price of gas had been raised, and the profit increased thereby. But these gentlemen seem determined to take credit for everything new, as if the only object gained was to add to their honour and glory.

"As for the samples given by Mr. Treasurer M'Ilwraith of the extensive additions made to capital, I have to remark that the blame, if blame there be, must rest on those who placed the works on so small a piece of land at first.* The original projectors never calculated on the consumption of gas reaching even ten millions of cubic feet, and they made arrangements in conformity with this expectation. When the consumption grew to twenty millions, was it surprising that large additions to the apparatus became necessary, and that more land was wanted for the purpose? To be useful, that land required to be adjacent to the old works; and is it to be wondered at, that, when the one party was an anxious buyer, and the other an unwilling seller, without the compulsion of an act of Parliament to guide the requirements of either, exceedingly high prices had to be offered and paid? However unfortunate it may have been that the committee came to be placed in such a fix as to be compelled to pay extravagant prices, compared with the intrinsic value of the properties, still I hold that the policy was sound, and that not to have made the purchase would have been weak and suicidal. And so likewise Mr. Allison thought, for he took a leading and an approving part in effecting some of the purchases complained of. And I should like to ask Mr. M'Ilwraith, whether he would or could have acted differently, had he been a member of committee at the time? Do any of our modern patriots ever consider whether any credit was due to the former committees for *not* purchasing other properties equally contiguous with those purchased, but for which prices were demanded far more exorbitant than those bought? Or is it to be reserved to some future committee, when the consumption of gas has multiplied twenty-fold, to be compelled to make a purchase of these properties at twenty times the price formerly asked; and again in their turn to be reviled by another generation of Allisons and M'Ilwraiths, who, to catch some passing odour of popularity, shall be rising up to condemn the extravagance of their predecessors? 'O liberty, liberty!' said Madame Roland, on her way to the scaffold, 'how many crimes have been committed in thy name!' So may we say of our magnanimous friends in the Water Trust, 'O popularity, popularity! how many lies are told, and how much dust is thrown, to catch your applause and blind your mental vision!'

"'These and things like these,' it is said, 'ran up the capital to a vast amount; and thus a large portion of the stock of the works was wholly non-productive, from which one shilling never was and never can be obtained.' The spouter of this arrant nonsense must have had a poor opinion of his audience, if he imagined that they would be misled by such balderdash. After such an assertion one would expect to hear that, in place of interest at five per cent. having been regularly paid on the whole outlay or capital, with prices of gas continually reducing, and large profits realising all the while, the profit divided was wholly imaginary, or at least produced by raising the rates. But no such thing; the orator immediately goes on to assure us that 'the large capital had been reduced several thousand pounds; while the profits, instead of being only £1,500, had risen (of course under his peculiarly able and intelligent supervision) to close upon £4,000 a year,' &c. &c.

"I am desirous, once for all, to place the question in its true light; and, in order fully to explain the causes, and to show the vast advantages conferred on the community by the expenditure complained of, it will be necessary to enter at some length upon the whole subject of Mr. Ritchie's connection with the Gas-work, and the proceedings that were adopted by the successive committees since his appointment.

"The state of matters in September, 1839, was this:—The price of gas enormously high (11s. 3d.), while, at same time, the quality was exceedingly weak; the consumption apparently on the increase, but the revenue not increasing in proportion, although the price remained the same; the waste was excessive, being 40 per cent. on the quantity made.* Everything about the

* No. 1.—GREENOCK GAS WORKS.

	£	s.	d.	£	s.	d.
1829.						
June 26.—Total cost of gas works to this date, viz.:—						
Buildings, ground, tanks, and walls	2,627	2	5			
Gasholders, station-meter, purifiers, condensers, retorts, &c. ..	1,732	15	4			
Mains and services.....	2,840	19	4			
Sundries, plan, management, interest, &c.	1,170	3	8			
				8,371	0	9
1830.						
June 30.—Expended for pipes this year				760	7	3
1831.						
June 30.—Ditto, ditto				51	12	0
1836.						
May 25.—Paid Carmichael's heirs for ground	21	17	2			
„ town clerk anent the same .	11	9	0			
„ John Park for ground and house	700	0	0			
„ Crawford and M'Aulay for damage to property	70	0	0			
„ for tanks and gasholders....	1,670	5	9			
„ cost of new screen and wall .	260	0	0			
„ additions to retort-house ..	1,192	11	3			
„ new bench of ovens	313	14	8			
„ for pipes and tools	134	6	3			
				4,374	4	1
				13,557	4	1
1842.						
May 25.—Paid Crawley and M'Aulay for property	1,690	0	0			
„ additions and alterations, including valuation	163	3	6			
„ new condensers	535	4	9			
„ new wash-vessel	169	1	7			
„ ammoniacal water-cisterns..	111	0	0			
„ new sheds	123	5	4			
„ enclosure-wall and pavement	180	6	5			
„ main and service pipes	20	14	4			
				2,992	15	11
				16,559	0	0
1843.						
June 30.—Paid for meters	800	0	0			
„ main service-pipes	200	0	0			
				1,000	0	0
				17,550	0	0
1844.						
June 30.—Paid for meters	800	0	0			
„ extension of main-pipes .	200	0	0			
				1,000	0	0
				18,550	0	0
1845.						
June 30.—Paid for meters	1,100	0	0			
„ extending and enlarging main-pipes, services, and fitting up staircases	1,350	0	0			
				2,450	0	0
				21,000	0	0
1846.						
June 30.—Paid for meters	1,000	0	0			
„ extending main-pipes, services, and fitting up stair-pipes	500	0	0			
„ new purifiers, station-meter, and buildings connected therewith..	500	0	0			
				2,000	0	0
				23,000	0	0
1847.						
June 30.—Paid for new tank and gasholder	2,838	4	9			
„ new coal-store.....	564	4	9			
„ new screen-wall	375	5	11			
„ division and street walls	160	5	1			
„ new ground and property,	1,634	12	0			
„ main and service pipes..	1,000	0	0			
„ gas meters	426	15	6			
				7,000	0	0
				£30,000	0	0

In addition to the above, about £10,000 has been paid out of the profits during the last ten years for renewing and enlarging main-pipes and other extensions and improvements.

† No. 2.

Number of Consumers		Year.	Gross Revenue from Gas.						Bad Debts and Discounts.						Net Revenue, Annual Loss, and Loss per Cent.										
			Consumers by Meter.			Consumers by Contract.			Town and Harbour Lamps.			Bad Debts.			Discounts.			Discount on Town Lamps.			Net Revenue Realized from Gas.			Amount of Revenue had there been no Waste.			Amount of Annual Loss.			Loss per Cent.
by Metr	by Con.		£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	
89	433	1828-1829	622	13	9	818	12	2	787	2	5	24	16	5	0	0	0	309	8	4	1894	3	6	0	0	0	0	0	0	—
157	547	1829-1830	1053	7	6	1091	5	11	953	5	9	76	0	7	0	0	0	348	18	8	2672	19	11	3137	10	9	464	10	10	13·02
209	577	1830-1831	1387	11	4	1089	2	7	1010	10	4	108	14	3	19	18	4	360	0	4	2998	11	4	3680	13	1	682	0	9	16·36
278	618	1831-1832	1753	2	8	1131	11	10	1240	16	4	95	14	4	148	7	11	369	16	1	3311	12	6	3842	9	0	530	16	6	11·38
301	629	1832-1833	2003	2	7	1065	7	1	1146	3	10	49	18	8	169	5	5	438	18	4	3556	11	1	4337	1	1	780	10	0	15·61
328	700	1833-1834	2225	11	4	1225	15	0	1189	15	0	46	15	1	140	11	6	464	9	10	3989	4	11	5260	11	8	1271	6	9	21.49
369	751	1834-1835	2510	16	5	1187	14	1	1180	12	0	101	3	7	277	8	5	446	5	2	4054	5	4	5812	12	10	1758	7	6	26·48
416	819	1835-1836	2777	7	8	1172	16	0	1363	2	10	74	3	11	277	8	5	633	19	7	4327	14	4	6722	19	10	2395	5	6	31·07
436	845	1836-1837	2624	6	3	1214	18	11	1612	5	9	66	2	5	320	2	7	856	15	2	4208	10	9	6388	7	5	2179	16	8	28·55
475	916	1837-1838	2813	17	9	1323	15	9	1614	1	9	127	6	2	285	10	0	863	12	0	4475	7	1	7548	1	10	3072	14	9	34·81
515	984	1838-1839	2990	13	8	1382	15	1	1623	18	0	54	16	10	272	11	10	857	3	6	4812	14	7	8678	5	4	3865	10	9	39·19
649	992	1839-1840	3163	4	9	1326	15	11	1638	5	0	367	2	6	299	11	8	603	9	0	4858	2	6	7273	13	1	2415	10	7	28·27
1193	350	1840-1841	3949	14	0	301	12	5	1599	15	0	18	9	6	394	12	5	490	6	6	4947	13	0	5625	11	7	677	18	7	10·37
1402	281	1841-1842	4427	18	6	272	19	2	1619	1	4	22	18	3	200	1	10	520	17	6	5576	1	5	6093	5	5	517	4	0	7·56
1504	220	1842-1843	4300	9	0	229	17	11	1609	14	1	65	3	10	264	11	9	514	18	8	5295	6	9	5958	10	9	663	4	0	9·74
1988	152	1843-1844	4931	3	0	156	7	0	1787	3	10	26	2	9	546	7	8	630	3	11	5671	19	6	5986	0	8	314	1	2	4·36
2750	121	1844-1845	5471	13	6	139	18	5	1659	4	5	23	2	7	597	16	8	464	12	4	6185	4	9	6481	7	4	296	2	7	3·91
3554	19	1845-1846	6951	3	4	66	1	0	1514	17	0	45	19	8	876	0	9	349	6	1	7260	14	10	7649	10	2	388	15	4	4·35
4000	16	1846-1847	7755	5	0	69	8	7	1520	19	10	31	3	4	975	5	6	430	6	9	7938	17	10	8484	4	3	545	6	5	5·51
4250	15	1847-1848	7302	9	0	68	11	6	1373	5	2	58	8	11	515	10	2	178	1	8	7992	4	11	8445	8	0	453	3	1	4·92
4458	25	1848-1849	6746	9	4	129	15	10	1239	10	10	56	11	9	349	16	9	78	3	4	7641	4	2	7821	12	2	180	8	0	2·16
4756	25	1849-1850	7008	4	0	155	4	3	1314	11	0	34	17	2	372	9	3	117	9	1	2953	3	9	8227	14	7	274	10	10	3·13

works was in a state of disrepair,—the purifiers, condensers, mains, &c., were altogether too limited in power and in extent, to manufacture well, or to supply freely the greatly increased demand. Now, supposing, for the sake of argument, that these works had been acquired in the condition I have just described, by an individual who, from want of skill, or otherwise, was not qualified to superintend the manufacture himself, and was consequently obliged to call in the aid of a competent person to manage for him; what advice, in such circumstances, would a man of sense and judgment be likely to give? It would, in my humble opinion, be to this effect:—The consumption of the article you deal in is susceptible of being indefinitely increased, by making the quality good and selling it at a moderate price; but you can neither improve the quality, nor venture to reduce the price, until *the waste* is checked, the works put in *good repair*, the apparatus greatly enlarged and improved, after the most perfect fashion; and, lastly, more land purchased on which to carry out your extensions and improvements. You must likewise endeavour to create the demand for it in all directions, by bringing your manufacture to the door of every possible customer, and have your main pipes enlarged so as to provide and secure an abundant supply to every one. The person to whom this was addressed might be supposed to answer thus:—I have already paid a large price for the works, and have even been obliged to mortgage the property to enable me to pay the price; and, besides having to pay interest on the money borrowed, I have a family to support, and therefore I cannot afford to expend more money. To this the manager would reply,—that in his opinion the repayment of the money was so certain, and the advantage to be derived from the outlay so great, his banker would be sure to assist him; but seeing that, however desirable, it would be impossible to go on with all the improvements at one time, the next best plan would be to proceed with the most pressing in the meantime, and spread the others over a series of years. The profits, I assume, will be so great, that with economy and the increasing demand, you will be able annually to pay off a large portion of the expense, and, by keeping all the while gradually lowering the price, you will by degrees vastly enlarge the consumption, and thus be prepared to give full effect to your improvements when completed, and be in a position at once both to derive to yourself and communicate to your customers the full benefit of them. By acting steadily on this principle, you will soon get your outlay repaid, pay off your mortgage, and at same time confer a great boon on your customers, who will be now receiving a superior article at a lower price.

"Now, that was in substance the prudent advice given by Mr. Ritchie to the committee in 1839; an advice which has been so successfully carried out by that and subsequent committees, that these spouters of 1851 are enabled to bespatter themselves all over with praise and self-gratulation.

"But lest it should be supposed that I give undue credit to the present able and indefatigable manager, Mr. Ritchie, I will now glance at certain things in his management, and contrast them with the state of affairs previous to his taking charge.

"1st, When Mr. Ritchie entered upon office, in 1839, owing to the slovenly manner in which the collections had been managed, there was outstanding a large amount of arrears (£800), the accumulations of years. By dint of great exertions about a half was recovered; but the balance had to be wiped off. In 1839 the consumers numbered about 1,500; in 1850 they had increased to 4,780; and the collections are made three times a-year, in place of twice; but, with what method and regularity are they now conducted! To give an instance,—the books having been closed on 25th May, 4,500 schedules were issued and delivered, and by the 30th of June £2,500 collected, being within £10 of the whole sum due. This is very remarkable, when we consider, that 524 of the consumers' accounts for the year are under 5s.; 1,000 from 5s. to 10s.; 1,250 from 10s. to 20s.; 880 from 20s. to 40s., and only 818 above £2. The bad debts for the five years from 1835 to 1839 (not including the £350 struck off in 1840), amounted to £423, upon a revenue of £20,000, equal to above 2 per cent.; while for the five years ending in 1850, the bad debts were only £217, upon a revenue of £36,000, being at the rate of 0.125 per cent., and that, too, when the class of consumers was inferior, and much more extended.

"2nd, It is well known that the retort-bench, and such like parts of the machinery, require a constant large annual outlay to keep them in good working condition. In the two years before 1840, when Mr. Ritchie first took charge, a very small sum (£270) had been expended for such purposes, or in extensions of any kind; the consequence was, that a considerable expenditure was incurred in that year, which ought to have come out of the profits of previous years. It is a singular fact connected with this matter, that in the winter months of the four years preceding 1839, the annual consumption varying from 13½ to 17½ millions, the number of retorts in use was 24, and when the consumption came to be nearly doubled, owing to an improved method of working, the same number of retorts were found to be sufficient, and consequently the same number of workmen.

"3rd, The next thing I shall notice is the description of coal used in the manufactory.* Almost every one is familiar with the varieties that may be used in making gas. During the years 1837, 1838, and 1839, there was consumed 4,594 tons of splint coal, and 1,555 tons of cannel coal. It is well enough known that the former produces a fair quantity of gas, but of very weak illuminating power. It follows, then, that the consumers of gas at that time, not only paid an extremely high price (11s. 3d.), but had to put up with a very inferior quality.† Since 1840, none but cannel coal has been used; and this of itself proves that the illuminating power of the gas has been very superior since that time, and of course has conferred a corresponding benefit on the consumers. Some may choose to deny this; nevertheless there cannot be a doubt about it among men of common sense and common honesty. From jottings of trials made from time to time by the former manager, it appears that the length of time a four-inch jet took to consume one cubic foot of gas, varied from 48 to 60 minutes. Now-a-days it takes never less than 75, and generally 80 or 85 minutes.

"4th, Another particular in which Mr. Ritchie's management contrasts favourably with that of his predecessor, is the large sum now realised from the sale of tar, ammoniacal water, &c. The sum annually realised from tar previous to 1840 (no water nor coke was then sold), was about £470.

"In the year 1846, they realised		£399
"	1847, "	547
"	1848, "	447
"	1849, "	547
"	1850, "	562

"5th, As regards economy in the management of the manufacture generally, it will be sufficient to satisfy any man of ordinary understanding, to call attention to the table in the Appendix, No. V., which will speak for itself, and I would simply ask the question, whether, looking to the annual expenditure of coals, wages, salaries, lime, &c., there is any evidence of extravagance or mismanagement on the part of Mr. Ritchie, either as compared with his predecessor, or as compared with any other similar work?

"6th, But, that for which Mr. Ritchie more than for all others deserves the greatest credit, and which will remain an imperishable memorial of his usefulness, long after the envenomed and unfounded assertions of his traducers have sunk into oblivion, is his having in so short a time diminished, and ultimately almost entirely got rid of, the enormous waste that had previously been going on in the manufacture of gas. For this the community and the Gas Committee owe Mr. Ritchie a debt of gratitude and something more, which I fear the present generation of his employers have not the generosity either to acknowledge or repay. From this source alone, the saving is not less than £3,000 a-year.

"I might proceed to prove this fact in many ways, but it may be enough to give one or two simple illustrations.

"The quantity of gas made in the year ending May, 1839, was 17½ millions of cubic feet, which, at 11s. 3d. per 1,000, should, if there had been no waste, have yielded a gross revenue of £9,843. Giving credit for the gas consumed in street lamps *beyond what was paid for*, the gross revenue actually realized stood thus:—

From Meter consumers	£2,990	0	0
" Contract consumers	1,383	0	0
" Street lamps	1,623	0	0
	£5,996	0	0

Showing a shortcoming of about £3,850, the greater portion of which was loss to the community.

Look again to the state of matters in 1850. The quantity manufactured was 26¼ millions, which at 6s. 8d. per 1,000 feet should produce a revenue of £8,743 0 0

The real revenue was—

From Meter consumers	£7,008		
" Contract consumers	155		
" Street lamps	1,314		
	£8,477	0	0
Leaving a deficiency of only	£266	0	0

* No. 3.—STATEMENT SHOWING THE COST OF COALS, AND THE QUANTITY USED, AND THE RETURN FROM THEM IN GAS, &c.

Year.	Coals. Parrot. Tons.	Coals. Splint. Tons.	Total Cost of Coals.	Average Price of Coal.	Gas Manufactured.	Average Produce per Ton.	Price per 1000 Cubic Feet.	Average Discount to Meter Consuming per 1000.	Return per 1000 Cubic Feet Gross Revenue, exclusive of Lamps.	Return per 1000 Gross Revenue, including Lamps.	Loss per 1000 Cubic Feet.
			£ s. d.	s. d.			s. d.	s. d.	s. d.	s. d.	s. d.
1828-1829	448	68	366 7 11	14 2¼	3,200,000	6,200	12 6	..	9 0	10 11	—
1829-1830	716	..	485 17 11	13 7	5,700,000	7,960	12 6	..	7 6¾	10 10½	1 7½
1830-1831	807	..	517 5 2	12 10	7,412,000	9,184	11 3	0 2	6 8½	9 4¾	1 10¼
1831-1832	929	..	612 7 5	13 2	8,278,670	8,900	11 3	0 8½	6 1¾	9 11½	1 3¾
1832-1833	1174	..	748 10 6	12 9	8,880,310	7,564	11 3	0 9	6 10¾	9 5¾	1 9¾
1833-1834	1245	..	851 7 5	13 8	10,510,940	8,442	11 3	0 6¾	6 6¾	8 1¾	2 5½
1834-1835	1150	25	746 17 7	12 8¾	11,800,000	10,040	11 3	1 1½	6 3	8 3	3 0
1835-1836	1293	202	973 17 5	13 0	13,704,170	9,166	11 3	0 11¼	5 9	7 9	3 6
1836-1837	553	1522	1696 18 1	16 4½	13,566,900	6,538	11 3	1 2¼	5 7¾	8 0¾	3 2¾
1837-1838	452	1542	1558 7 4	15 7½	15,688,000	7,863	11 3	0 11¼	5 3¾	7 3¾	3 11¼
1838-1839	550	1530	1401 11 6	13 5½	17,534,000	8,430	11 3	0 10	4 11½	6 10	4 5
1839-1840	1404	205	1224 7 1	15 2½	15,189,000	9,463	11 3	0 10½	5 10¾	8 0¾	3 2¾
1840-1841	1368	..	1067 18 9	15 7½	13,058,000	9,545	10 0	0 11½	6 6	8 11½	1 0½
1841-1842	1497	..	1238 19 3	16 7	13,674,300	9,134	10 0	0 5	6 10½	9 2¾	0 9¼
1842-1843	1473	..	1152 8 4	15 8	13,606,500	9,237	10 0	0 7	6 7¾	9 0¾	0 11¾
1843-1844	1510	..	1169 14 9	15 9	14,377,500	9,521	10 0	1 1	7 0¾	9 6	0 6
1844-1845	1701	..	1368 8 6	16 1	16,509,700	9,705	9 2	1 0	6 9¾	8 9¾	0 4½
1845-1846	2342	..	1923 9 1	16 5	21,410,000	9,141	8 4	1 0½	6 6½	7 11½	0 4½
1846-1847	2716	..	2706 15 9	19 11	23,738,500	8,740	8 4	1 0½	6 7½	7 9½	0 6½
1847-1848	2660	..	2720 12 10	20 5½	24,526,500	9,200	7 6	0 6½	6 0½	7 1½	0 4½
1848-1849	2420	..	2085 4 9	17 3	24,918,600	10,292	6 8	0 3½	5 6¾	6 6½	0 1½
1849-1850	2833	..	1880 7 0	13 3	26,256,000	9,271	6 8	0 3½	5 5½	6 5½	0 2¾

† It would not be difficult to prove that, had the managers of that day used a superior coal, so imperfect was their system, there would have been an actual loss in place of a profit.

"Had the price in 1839 been 6s. 8d. instead of 11s. 3d., the profit and loss account would have stood thus:—

Seventeen and a half millions, at 6s. 8d. per 1,000			£5,833 0 0
Less waste, 40 per cent.			2,333 0 0
Gross Revenue			£3,500 0 0
Working Expenditure	£2,850 0 0		
Interest	670 0 0		
Discounts and bad debts	610 0 0		
		4,130 0 0	
Loss, without making any allowance for extraordinary expenses			£630 0 0

"To show more clearly the great gain to the community from the improved works now effected, and superior management, let us glance at the probable result of the current year, 1851. The price is to be only 6s. 3d. per 1,000 feet, and the consumpt will likely reach thirty millions; so that there is every likelihood, notwithstanding, that the gross profit will amount to £4,000. Had the price remained at 11s. 3d., what would have been the state of matters?—

Thirty millions at 11s. 3d.			£16,875 0 0
Coke, Tar, &c.			825 0 0
			£17,700 0 0
Less waste, 3½ per cent., say	£600 0 0		
" Discounts, 4 per cent.	670 0 0		
" Bad Debts, ½ per cent.	100 0 0		
" Ordinary expenditure	5,100 0 0		
" Extraordinary expenditure	530 0 0		
		7,000 0 0	
Profits			£10,700 0 0
Thus giving to the public by reduction of price	£6,700 0 0		
Left to repay Capital and for Profit,	4,000 0 0		
			£10,700 0 0

"I defy any man of candour and integrity, to show that these figures are not fairly deducible from the actual history and progress of the works; and I would leave it to the same spirit of unprejudiced and unbiassed honesty to say, to whom we are mainly, if not altogether, indebted for so happy a termination to twelve years of unremitting and laborious exertion.

"The only other matter that seems to require special notice, as evidencing Mr. Ritchie's successful management, is the increase of the consumption of gas. Since the extensions and improvements of the works, and the lowering of the price of gas, the increase of consumpt has been quite marvellous. Our supposed purchaser has had his expectations more than realised, and the prudent adviser has been more than justified in his views. Since 1841 the quantity of gas made has doubled, and the actual consumption has trebled. Is not this, then, the true and the only solution of the vast expenditure, which has so staggered the senses, and bewildered the judgment, and inflamed the vanity of our modern Committee-men? The apparatus of 1840 was perfectly inadequate to make, purify, and deliver even thirteen millions of feet. Was it to be expected that it could be made to turn out more than double that quantity without great outlay? Was it or was it not wise policy in the committees of former days to make the extensions *on a great scale*, so as to admit of expansion in the consumption to an unlimited extent; rather to make them *on a small scale*, in which case further enlargements would have been demanded within a short period? Was it not the wiser course to have everything made large, substantial, and enduring, even at a heavy expense, rather than construct them in a puny, slim, and inefficient manner, liable to accident and early decay?

"I shall endeavour to enumerate the principal objects and apparatus on which the enlarged expenditure took place.

"1st, It was found that much of the waste proceeded from using malleable iron pipes for services, in place of cast iron; and the whole of the former were lifted and replaced at an expense of £1,500 0 0

"2nd, Owing to the inadequacy of the mains there was at all times a great deficiency of supply of gas, especially in the eastern parts of the town. The pressure, which at the Gas-works was 12-10ths, fell to 5-10ths eastward of Cathcart Square, and to 3-10ths in Cartsdyke. And besides, there were many streets and lanes where no pipes had ever been laid. The cure of these evils caused an outlay of 8,000 0 0

"3rd, The gas-holders were much too small. On many a winter night the supply in them was quite exhausted, and the public left dependent on the gas as it issued from the retorts; so that a trifling accident might at any time have left the town in darkness. The cost of the new gas-holder was 3,000 0 0

"4th, The gas was oftentimes neither properly condensed nor purified, and as often was used with a mixture of sulphur, tar, and ammonia. To alter the old and form a new condenser and washing vessel cost 600 0 0
And new purifiers 450 0 0

"5th, It frequently happened that when the price of coal was extremely low, the committee were anxious to lay in a stock, but could not do so for want of room and covering. Therefore it was thought advisable to build a coal-shed at a cost of . . 500 0 0

"6th, The houses, ground, and enclosure walls, acquired and built at various times, cost 4,200 0 0

"7th, Being considered that it would encourage consumption to give out the meters on loan, instead of making consumers buy them, a stock of meters had to be purchased, and these may be valued in this estimate at 4,000 0 0

"The results of this great outlay of . . . . . £22,250 0 0 were,—*First*, That interest has been regularly charged and paid on the capital at 5 per cent.—a fact which Mr. M'Ilwraith conceals.

"*Second*, That it has enabled the Committee to reduce the price, in twelve years, from 11s. 3d. to 6s. 3d. per 1,000 feet, being a saving of £6,000 per annum; and

Third, That the Committee are enabled to divide £1,500 a-year betwixt the two Town Trusts interested in the works, and to leave £2,500 besides, to repay the previous outlay of capital on extensions, pipes, and meters.

"I ask, then—I am entitled to ask—these cavillers to show, where the money has been improperly, unadvisedly, injudiciously, or unprofitably expended? I may admit, I do admit, that in regard to some trifling items of expenditure, there has been some slight mismanagement—extravagance, you may call it, such as is invariably incident to even the best managed and best regulated concerns; but that it was to such an extent as to give any reasonable or liberal-minded man occasion to reflect seriously on Mr. Ritchie, or any of the several committees who acted with him in that matter, I deny. Where is there to be found either a private or a public company, that can boast so beneficial and successful results of a system of expenditure conducted with so much economy and singleness of purpose? There are few such works to be found; and I claim for the committees of 1839, 1840, and subsequent years, who organised these improvements, the credit of having adopted them and willingly

No. 4.

STATEMENT EXHIBITING EXPENDITURE IN THE VARIOUS DEPARTMENTS.

Year.	Interest.	Coals.	Wages.	Salaries.	Lamps.	Repairs to Retort Bench.	Lime.	Feu-duties, Taxes, and Insurance.	Repairs, Stationery, and Incidents.	Total, exclusive of Interest.	Total, including Interest.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1829	304 14 3	366 7 11	93 19 3	158 7 3	44 4 1	1 18 3	44 3 6	20 8 7	19 18 5	749 7 3	1054 1 6
1830	464 0 8	485 17 11	171 11 2	165 2 3	68 19 7	101 2 8	67 18 0	28 17 5	67 1 7	1156 10 4	1620 11 0
1831	339 17 2	517 5 2	207 11 1	324 18 4	111 3 11	201 14 5	91 0 6	37 12 9	62 15 8	1554 1 10	1893 19 0
1832	411 7 6	612 7 5	347 1 5	200 0 0	238 19 1	207 4 1	116 9 7	22 8 9	75 2 4	1819 12 8	2231 0 2
1833	386 11 2	748 10 6	349 18 4	207 9 9	222 4 6	147 18 4	82 15 7	27 14 2	72 18 3	1859 9 5	2246 0 7
1834	405 10 5	851 7 5	461 2 11	220 0 0	209 7 5	267 1 1	57 19 10	47 8 9	171 16 11	2286 4 4	2691 14 9
1835	529 12 9	746 17 7	461 18 7	220 0 0	205 18 3	35 13 7	35 6 3	77 17 3	119 6 5	1902 17 11	2432 10 8
1836	638 7 2	973 17 5	586 12 9	220 0 0	217 10 4	157 7 7	57 1 6	73 19 7	126 2 0	2412 11 2	3050 18 4
1837	678 14 2	1696 18 1	616 6 3	220 0 0	265 5 4	318 14 6	72 18 11	63 1 5	99 17 8	3353 2 2	4031 16 4
1838	689 15 3	1558 7 4	632 9 2	220 0 0	273 15 5	183 19 7	87 0 10	71 11 5	95 18 3	3123 2 0	3812 17 3
1839	675 6 4	1401 11 6	573 11 0	219 3 0	267 5 6	87 1 9	94 11 6	79 13 5	64 16 10	2817 14 6	3493 0 10
1840	701 2 4	1224 7 1	465 1 3	233 18 11	202 1 3	90 12 9	78 14 4	129 6 1	224 16 9	2648 18 5	3350 0 9
1841	686 11 6	1067 18 9	372 16 3	230 0 0	246 3 0	200 0 0	71 13 6	205 7 4	95 0 9	2488 19 7	3175 11 1
1842	719 18 10	1238 19 3	353 5 10	298 0 0	274 17 8	200 0 0	48 9 5	103 12 11	174 0 3	2691 5 4	3411 4 2
1843	734 9 1	1152 8 4	436 11 0	321 17 4	267 19 7	331 4 5	46 11 7	164 13 1	259 12 2	2980 17 6	3715 6 7
1844	759 6 2	1169 14 9	326 13 4	300 0 0	230 14 1	121 12 10	38 6 6	122 16 3	134 16 11	2444 14 8	3204 0 10
1845	783 10 7	1368 8 6	351 5 9	297 0 0	210 19 11	131 19 11	45 10 0	139 6 9	148 5 5	2692 16 3	3476 6 10
1846	1058 18 1	1923 9 1	458 7 5	308 0 0	246 3 1	259 18 5	69 2 5	140 6 0	187 19 10	3593 6 3	4652 4 4
1847	1358 5 4	2706 15 9	616 15 8	295 0 0	296 18 11	233 10 1	64 19 5	153 18 3	665 0 11	5032 19 0	6391 4 4
1848	1466 15 9	2720 12 10	621 15 0	330 0 0	225 1 0	294 8 0	71 11 0	181 3 11	363 2 1	4807 13 10	6274 9 7
1849	1466 18 8	2085 4 9	533 5 9	330 0 0	189 17 11	276 8 8	71 16 0	259 18 8	296 16 9	4043 8 6	5510 7 2
1850	1380 8 2	1880 7 0	597 14 10	330 0 0	206 1 1	234 12 10	82 9 6	258 4 7	249 10 1	3838 19 11	5219 8 1

SHOWING THE EXPENSE PER 1000 FEET FOR DIFFERENT SERIES OF YEARS.

Years.	Interest.	Coals.	Wages.	Salaries.	Lamps.	Retort Bench Repairs.	Lime.	Feu-duties, Taxes, &c.	Stationery, Repairs, &c.	Total, exclusive of Interest.	Total, inclusive of Interest.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
3 years ending 1831	1 4¼	1 8·1	0 7·	0 9·5	0 3·3	0 4·8	0 3·	0 1·3	0 2·1	4 3	5 7¼
4 ,, 1835	0 10½	1 6·	0 9·9	0 5·1	0 5·3	0 4·	0 1·8	0 1·1	0 2·6	3 11¾	4 10½
4 ,, 1839	0 10¾	1 10·3	0 9·6	0 3·5	0 4·2	0 3·	0 1·1	0 1·2	0 1·6	3 10½	4 9¾
1 ,, 1840	0 11	1 7·2	0 7·4	0 3·7	0 3·2	0 1·4	0 1·3	0 2·0	0 3·6	3 5¾	4 4¾
4 ,, 1844	1 0¾	1 8·3	0 6·5	0 5·	0 4·5	0 3·7	0 0·9	0 2·6	0 2·10	3 10½	4 11¼
4 ,, 1848	1 1	2 0·3	0 5·7	0 3·4	0 2·8	0 2·6	0 0·7	0 1·7	0 3·8	3 9	4 10
2 ,, 1850	1 1¼	1 6·6	0 4·3	0 3·1	0 1·9	0 2·4	0 0·7	0 2·4	0 2·6	3 1	4 2¼

aided in their execution; and for Mr. Ritchie, the credit and the honour of having suggested, superintended, and carried them out to a prosperous issue, with an energy, perseverance, and activity, mental and physical, which only a man of genius, skill, and capacity could have exhibited.

"Some of you may perhaps think with me, that I have taken too much notice of the remarks made at the meeting on the 18th, and bestowed too much trouble on an exposure of the groundless and arrogant assumptions of some of your number. I am anxious, however, as I have already said, to set the matter at rest in the minds of honest men, and, although I cannot prevent men from carping and cavilling even at straws, and spending their breath on 'dog's meat,' and other cheese-parings, I think I have satisfied you that the assertions made at the late meeting were nothing better than frothy emanations from ignorant and prejudiced individuals. And if I have taken too much pains to elucidate the truth, it proves at least that I have some desire that the truth should be distinguished from the false and distorted views that have too frequently of late been exhibited to the public; and that I have also some desire to rescue, from the fangs of a most ruthless and unrelenting faction, the fame and good name of a worthy and deserving man.

* * * * *

"It is indeed an infinite pleasure and satisfaction to me to look back upon the part I have taken in your public affairs, and that it was the means of gaining me the friendship of many men of character and worth, among whom I am proud to name your gas manager, Mr. Ritchie. Nor can I forget, that some venerated and ever-to-be-lamented friends have gone to their rest; and that the voices of those eminent men, Walter and Robert Baine, are no longer heard to direct your counsels and animate your exertions for the public good. I can only hope that you will breathe their spirit and walk in their steps; for, men more singularly endowed with integrity of character, honesty of purpose, genuine patriotism, laborious zeal, and at the same time unobtrusiveness of deportment, never lived or moved among us.

"But with what a painful contrast does the conduct of some members of the present Council stand, with these great and good men of a former day,—men of a modesty as unassuming as their character was excellent and their motives unimpeachable? It will be long before the electors find men to fill their places; and certainly their places are not filled by those professional spouters, who, although capable of talking by the hour or piece, and causing a great deal of din and splutter, have neither the mind, the manners, nor the feelings, that fit them to be good representatives of an intelligent constituency; and who, besides, are far less useful than many a one whose voice is never heard.

"I am, gentlemen, your obedient servant,

"ADAM FAIRRIE,

(*Late Provost of Greenock; in office six years.*)

"Liverpool, 28th April, 1851."

Correspondence.

GAS COOKING APPARATUS.

SIR,—I hope parties who have turned their attention to cooking by gas will send something to the exhibition at the Royal Polytechnic Institution, Regent-street, that a union of ideas may be brought together, which will further the object of those who are interested in the extension of the use of gas for culinary purposes. I have placed two apparatus there; one designed for a small family, and one which will cook for a very large party. The small one is similar to the one invented by me twenty-five years back, and used by many families with economy when gas was double the price it is at present. We have one in use in my kitchen, which was made in 1828, and from this date has been constantly in use up to the present time, and is as efficient now as in the first year it was used, the only repairs having been to the boiler and gauze-burner. When I am asked the question, "Are they durable?" I reply, "Come and see mine, which has been in use upwards of twenty years."

I would observe that I have no interest in the sale of any apparatus, nor do I intend to have. J. SHARP.

Gas Works, Southampton, April 29, 1851.

IMPROVEMENTS IN GAS METERS.

SIR,—Having had a letter sent to me by Mr. Thomas Whimster, of North Port, Perth, wherein he states that he has registered a design for certain improvements in wet gas meters, and inviting gas companies and meter manufacturers to participate in the same, I should esteem it a favour if you would insert a notice in your valuable journal to the effect that I have been manufacturing meters for several years past on an improved principle, embracing all the improvements claimed by Mr. Whimster, and the same are in use in several of the metropolitan gas companies.

The improvements hereunder mentioned will have the effect of preventing fraud being practised:—

Registering the meter by stand-pipe, continuing the same to back of meter, thereby preventing the escape of water if the meter is tilted, and discontinuing side-plug.

Preventing the escape of gas from the spout by means of the back water flowing into the chamber of discharge in front of meter.

The gas way of the spout being so constructed that, in case of tilting the meter forward, the gas way becomes water-logged or luted. HENRY JONES.

44, *Old-street, St. Luke's, London, May* 8, 1851.

Register of New Patents.

WILLIAM BOGGETT, of St. Martin's-lane, in the county of Middlesex, gentleman, and WILLIAM SMITH, of Margaret-street, in the same county, engineer, for "*improvements in producing and applying heat, and in engines to be worked by steam or other elastic fluid, which engines are also applicable as pumps.*" Patent dated Oct. 3, 1850.

The first part of these improvements is for the application of the heat arising from the combustion of inflammable gases to every variety of domestic and manufacturing purposes. It has, more especially, reference to coal gas as a material so generally in use, and consists in arrangements by which the greatest amount of heat that the combustion can produce is obtained, and by which the disadvantages attending the use of gas as a general heating agent for domestic and manufacturing purposes are removed. These disadvantages are caused, for the most part, by the quantity of residual deposit the gas leaves in burning. This results, according to the patentees, from the imperfect manner in which the process of combustion is effected by the present method of only admitting the atmospheric air into contact with the gas at or near the point of ignition, and also from the peculiar formation of the escape-holes through which the gas passes into the atmosphere in vertical streams, giving a tendency to the dispersion and consequent loss of the unconsumed carbon. It is quite evident from the smoke which we see issuing from gas-burners, and the blackened walls and ceilings caused by that smoke, that all the carbon produced in the decomposition of the gas by the process of combustion is not consumed; and it is, of course, perfectly natural to say, as the patentees do, that this imperfect combustion is caused by the lowness of the temperature at which the combustion takes place, in consequence of the low temperature of the air supplying the gas with oxygen; or, in other words, the temperature resulting from the combustion of the hydrogen of the gas, although sufficient to decompose fresh portions of the gas into carbon and hydrogen, is too low to effect the combination of the whole of the carbon with the oxygen of the air, this lowness of temperature being the result of the comparatively cold state of the atmospheric air which supplies the oxygen for the combustion, and of the imperfect manner in which, at the moment of combustion, the gas is mingled with the atmospheric air. Contrary to the present practice, in which all mixture of the atmosphere with the gas previous to the combustion is carefully guarded against, the patentees propose to remove these disadvantages by allowing the atmosphere to enter amongst the gas at some distance before the point of ignition; and propose, further, to heat both the air and the gas, or one of them, before they arrive at the point of ignition, and also to give the streams of gas and air, as they escape from the burners, a horizontal instead of a vertical direction, that the carbon may be rendered less liable to escape unconsumed. In the manner, therefore, in which they apply heating by gas there are three principal features—the mingling of atmospheric air with the gas at some distance before the point of combustion; the heating of the gas and the air, or of one of them, previous to the combustion; and the giving a horizontal direction to the streams of gas, instead of a vertical one, as at present commonly practised; and, by their arrangements for carrying out these principles, the patentees state that they are enabled to obtain the greatest amount of heat that the combustion can be made to produce.

The different varieties of burners which can be constructed so as to embrace these features are very numerous: the drawings accompanying the specification show a very great number. But the principle will be easily understood, the varieties being generally merely modifications of the same forms.

One of them is an arrangement of the burner by which the gas is heated before coming into contact with the atmosphere; the gas supply-pipe is open at the top, and a case, or chamber, through which the pipe passes is closed at the top and bottom, and perforated near the bottom with a number of small holes. The gas passes from the pipe into the chamber, and, issuing thence through the lateral apertures near the bottom of the case, combines there with the oxygen of the air; and, as the flame will play round the sides of the chamber, the interior of that chamber will be maintained at a very high temperature, and, consequently, the gas in passing through will be greatly heated. The effect of this heating will of course be to raise considerably the temperature of the combustion; and much more, if not all, of the carbon arising from the decomposition of the gas, and suspended at a white heat in the flame, will combine with oxygen.

Another arrangement for mingling the gas with air before it reaches the ignition point, and for heating both the gas and the air on their progress to that point, is an air-chamber, open at the bottom, and pierced near the top with a number of small lateral holes, the gas-tube entering through one side of the air-chamber and rising to the top of the chamber, whence it descends a certain distance, where it terminates open. The gas becomes highly heated in passing through that portion of the tube which is situated in the top of the air-chamber, as does also the air in passing with the gas through the orifices in the top of the chamber. One modification of these burners, which is used in the application of this system of gas-heating to domestic purposes, consists in a horizontal branch from the gas-pipe, the lower half of the branch being perforated with holes and surrounded with wire-gauze. The flame from the orifices in the lower portion rises up, and, as it were, wraps the upper half in a sheet of flame; keeping that half, therefore, at a very high temperature, which is, of course, communicated to the gas before it passes out of the orifices.

Another modification consists in passing the gas into a narrow air-chamber, the tops of the sides of which are composed of one or two layers of wire-gauze. The patentees have found three layers to be a very suitable arrangement, the advantage arising from the use of the wire-gauze in this, and the latter modification is presumed to be from the more thorough manner in which it enables the air to act upon the gas.

Among the other numberless varieties into which these burners may be modified is one in which the lateral apertures are replaced by very small vertical tubes, in which the combustion takes place, the mixture of air and gas being heated by passing through the spaces between the tubes.

Illustrations are given of the application of this system of heating by gas to almost every domestic process, and also to several manufacturing purposes. In all these applications the same principle of burner is carried out, the flame being made to play upon one side of a metal-heating surface, to the other side of which is exposed the

substance it is desired to heat. Thus, in applying the system to roasting, it is not by the direct action of the gas that that process is carried out, but by a heating surface which envelopes the material under operation, and on the outside of which the flame plays. There are several constructions of boilers, among which is one in which the combustion of the gas and air takes place in conical tubes passing vertically through the boiler. Another construction is one in which a spiral tube or worm, leading from the top of a double outside case containing the water, passes through the chamber in which the combustion takes place. A continual current of heated water is kept ascending by this means: such an arrangement, as well as that last described, is very suitable to the heating of baths. There is an italian-iron, a stove, a singeing apparatus, a soldering apparatus, and many other useful applications far too numerous to mention separately; but in all the principle is precisely similar.

The patentees state that the same principle may be carried out in burners of common construction, but in a less certain manner, by perforating the vertical or cylindrical surface of the burner with lateral apertures, gradually decreasing in size towards the top. The gas, from its superior lightness, would rise to the highest and smallest apertures, and then pass out, while the air would enter through the lowest and largest.

They also state that they prefer as material for the formation of their burners an artificial stone made from the silicates of potash and alumina.

They claim in this portion of their improvements:—

First. The increase of heat obtainable from the combustion of gas, by intermixing it with atmospheric air, previous to its emission from the burners; and, by heating the gas and air, or one of them, previous to the emission; and also by causing the gas to be emitted through lateral apertures. And they further claim each of these methods independently.

Secondly. The application of heating by gas by means of the burners of the peculiar formation as above described.

Thirdly. The formation of burners of artificial stone as above described.

Here follow separate claims for each of the applications of the system to useful heating purposes, which are separately described in the specification. Among others are an italian-iron, a soldering apparatus, a bath apparatus, and a horse singeing-machine.

The second part of the improvements is for the application of the same principle to blast-furnaces. The patentees propose to introduce a stream of carburetted hydrogen into the blowing-cylinder, regulating the quantity by means of a stopcock or valve. They state that twenty per cent. of gas is the proper proportion to introduce into the blast. The effect of this mixture of gas with the air issuing from the tuyeres in a state of combustion will of course be to raise considerably the temperature of the furnace, and will be highly advantageous in the manufacture of iron.

In this part of the invention they claim the mingling of carburetted hydrogen with the air-blast of smelting-furnaces, previous to the emission of the same from the tuyeres into the furnace.

The third part of the improvement relates to a new construction of rotary engine, by which the pstentees state that they have much less irregularity of wear and tear; and have almost, as it were, a direct action without any material abatement. This description of engine may be applied to the raising and forcing of water, as well as to the exhausting and compressing of air.

The patentees claim in this third part of their improvements:—

First. The peculiar arrangement and combination of the parts of which the rotary engine, as above described, is composed; consisting of the combination of a cylinder and cylindrical ring, both open to the steam; and one of them carrying a steam stop-blade or piston.

Secondly. The peculiar formation of the guide-arm, *d*, whether for the purpose of the engine above described, or applied to the purposes of other rotary engines.

Thirdly. The employment of the rotary engines above described as air and water pumps.

James Young, of Manchester, Lancaster, manufacturing chemist, for "*improvements in the treatment of certain bituminous mineral substances, and in obtaining products therefrom.* Patent dated Oct. 17, 1850.

This invention consists in treating bituminous coal in such manner as to obtain therefrom an oil containing parafine (which the patentee calls parafine oil), and from which oil parafine is obtained. The coals best fitted for this purpose are such as are usually called parrot coal, cannel coal, and gas coal, and which are much used in the manufacture of gas for the purpose of illumination, because they yield, upon distillation at a high temperature, olefiant and other highly illuminating gases in considerable quantity; and, although some of the coals last described contain a large amount of earthy matters, those matters do not interfere materially with the performance of this process. To obtain parafine oil from coals the following is the method of procedure:—The coals are to be broken into small pieces, and are then to be put into a common gas retort, to which is attached a worm-pipe passing through a refrigerator, and kept at a temperature of about 55 deg. Fahr. by a stream of cold water. The temperature of the refrigerator should not be made too low, lest the product of the distillation should congeal and stop up the pipe. The retort, being closed in the usual manner, is then to be gradually heated up to a low red heat, at which it is to be kept until volatile products cease to come off. Care must be taken to keep the temperature of the retort from rising above that of a low red heat, so as to prevent as much as possible the desired products of the process being converted into permanent gas. The coke or residue may then be withdrawn from the retort, which, being allowed to cool down below a visible red heat (to prevent waste of the fresh material to be introduced), may be again charged with a quantity of coals to be treated in the like manner. The crude parafine oil distilled or driven off from the coals as a vapour, will be condensed into a liquid in passing through the cold worm-pipe, from which it will fall into a vessel which must be provided to receive it. Instead of obtaining the whole of the parafine oil by distillation, a portion of it may in some cases, if thought desirable, be run from the retort (through an opening and a pipe provided in the anterior and lower part of the retort for that purpose) after it has separated from the coal and assumed a liquid form. The patentee prefers, however, in every case to distil or drive off the whole of the parafine oil to be obtained from the coal. The production of the desired products from a charge of coals in a retort will be known to be finished by the liquid ceasing to run from the worm. The crude product of this process is an oil containing parafine, which the patentee calls parafine oil. This oil will sometimes, upon cooling to a temperature of about 40 deg. Fahr., deposit parafine. Other arrangements of apparatus may be used for subjecting coals to the process for obtaining parafine oil therefrom, but that above mentioned is preferred as being well known and easily managed. But in order to obtain the largest quantity of crude parafine oil from coals by means of this process, and produce the smallest quantity of permanent gas by the action of the heat employed, whatever may be the apparatus used, care must be taken to heat the coals gradually, and to apply the lowest temperature necessary to complete the operation. During the distillation or driving off a permanent gas will be produced, and this gas may either be collected or suffered to escape, as may be thought expedient. The crude oil obtained, as already described, is purified in the following manner:—I put the oil into a cistern, and heat it (by a steam-pipe or other means) to a temperature of about 150 deg. Fahr. When thus treated, water and undissolved impurities contained in the oil will separate more readily from it than when cold, and, the oil being left in a state of rest and kept warm for about a day, many of those impurities will fall to the bottom of the cistern, and the oil may then be run off into another vessel, leaving the residuum behind. For distilling the oil the inventor prefers to use an iron still with a worm-pipe connected to it passing through a refrigeratory apparatus, which is kept at or about the temperature of 55 deg. Fahr., as already mentioned. The still is heated by a fire underneath it, which is kept up until the whole of the oil has been distilled over, and it will then be found that the still contains some dry carbonaceous residuum, which should be taken out before the still is again used. The oil is to be run from the condensing apparatus as it distils over into a leaden vessel, where to each 100 gallons there are gradually added 10 gallons of the oil of vitriol of commerce. After this mixture has been well stirred for about an hour, it is to remain at rest for about twelve hours, so that the oil of vitriol and the impurities with which it has combined may settle at the bottom. The supernatant oil is then drawn off into an iron vessel, and four gallons of a solution of caustic soda, of a specific gravity 1·300 (water being 1·000), added to each 100 gallons. The soda and oil are stirred together for about an hour, so as to neutralize any acid which may remain in the oil, and also take up any impurities capable of combining with it, after which the contents of the vessel are allowed to remain at rest for about six or eight hours, so that the solution of soda may subside, and then the supernatant oil is to be drawn off, and again distilled in the same manner as already described. Parafine oil obtained from the last-mentioned distillation contains a fluid more volatile than parafine, a considerable portion of which may be separated from the oil, and obtained in a separate state as follows:—The oil is placed in an iron still connected with a worm-pipe passing through a refrigeratory apparatus, and half its bulk of water being added, the contents of the still are boiled for about twelve hours, adding water from time to time, so as to keep about the same proportion of oil and water in the still.

The volatile fluid will pass over along with steam, and be condensed in the worm-pipe by the refrigeratory apparatus. This fluid will be clear and transparent, and, as it is lighter than water, it separates, on standing, from the water with which it will be mixed as it leaves the worm-pipe of the still. This fluid may be burnt for the purpose of illumination, or applied to any other useful purpose to which it may be applicable. The last-named process will separate the greater portion of the volatile fluid from the oil, but a larger quantity may be separated by prolonging the operation. The oil left in the still after the completion of the process is then to be carefully separated from all the remaining water (upon which it will float), and conveyed into a leaden vessel, where two gallons of oil of vitriol are to be added to each 100 gallons. This mixture is to be well stirred for six or eight hours, after which it is allowed to stand undisturbed for twenty-four hours, in order that the vitriol may settle to the bottom of the leaden vessel, carrying with it all impurities with which it has combined. The supernatant oil is now to be drawn off into another vessel, and to each 100 gallons there is added 28 lbs. of chalk, ground up with a little water into a thin paste. The oil and chalk are to be well agitated until the oil becomes entirely freed from any trace of sulphurous acid, which may easily be known by heating a little of it in a glass retort, and testing its vapours by moistened blue litmus-paper. If the vapours change the colour of the litmus-paper to read, the oil must be treated with more chalk. This oil is to be kept warm—say at 100 deg. Fahr.—in any convenient vessel for about a week, to allow impurities to settle, and it is then fit to be used for lubricating purposes, either by itself or mixed with an animal or vegetable oil, or it may be burnt by itself in argand lamps for the purpose of illumination. To extract parafine from the purified parafine oil obtained in the manner described, the oil is to be cooled to a low temperature—say to 30 deg. or 40 deg. Fahr.; and the lower the temperature the larger will be the quantity of parafine separated from the oil. In this way parafine is made to crystallize, when it may be separated from the oil by filtration through woollen or other cloths, and then squeezing it in a powerful press, by which means it will be made sufficiently pure to be employed for lubricating and some other useful purposes. But the parafine may be further purified, if required, by treating it several times, at a temperature of about 160 deg. Fahr., alternately with its own bulk of oil of vitriol and with a similar quantity of a solution of caustic soda (of the specific gravity already mentioned) until the parafine ceases to render the oil of vitriol black. It is then to be washed in a weak solution of soda, and lastly with boiling water, until the water ceases to change the

colour of red litmus-paper. Another method adopted to obtain parafine from parafine oil is, to put the oil into a still, and distil over one half or more of its contents. The portion then remaining will contain a much larger proportion of parafine than the parafine oil at first put into the still contained; this residue being then distilled over into a separate vessel, and allowed to cool. Parafine may be separated by filtration and squeezing in cloths, and also purified by treatment with oil of vitriol and soda, as before described. Parafine oil from which parafine has been separated, as above described, still contains parafine in solution, and is suitable for lubricating or lighting purposes.

Claim.—The obtaining of parafine oil, or an oil containing parafine, and parafine from bituminous coals, by treating them in manner before described.

John Oliver York, of Boulogne-sur-Mer, France, "*for improvements in the mode or manner of generating steam in locomotive, marine, and other boilers.*" Patent dated October 24, 1850.

This invention consists in applying gas, either separately, or in combination with coke, to the general purposes of evaporation; and is more peculiarly applicable to all land and other stationary boilers.

First of all, for the application of gas by itself for the purposes of evaporation. The drawings and description of the arrangement of boiler to carry out this application show a cylindrical boiler, containing a series of concentric spaces, which serve as flues. These spaces form nearly half circles in section, but are divided at the centre or lowest part of the boiler, so that, in fact, they are only in section similar portions of a circle very nearly approaching quadrants. The upper extremities of these spaces communicate with a flue, which runs along them all from one end to the other of the boiler, and leads into the chimney. Along the lower extremities of the spaces on each side runs the main pipe supplying the gas, and the main pipe supplying the air. Branch pipes lead at right angles from these main pipes, up into the flue spaces, and end very nearly at the top of the same. The branch gas-pipes are perforated at certain intervals with small holes, from which the gas issues to burn; and the branch air-pipes, which run along above the gas-pipes, have a continuous slot cut longitudinally in them, through which slot rushes the air to support the combustion of the gas. The patentee states that no precise proportion can be given for the diameter of the holes in the gas-pipe and the distance between them; for of course that entirely depends upon the pressure of the gas, and the quantity of heating to be performed. At the ordinary pressure of the gas works in towns, the patentee says that, for all ordinary purposes, a twentieth of an inch in diameter, and two inches between each hole, are very suitable arrangements. He states that a boiler upon this principle, although it does not present so extended a heating surface as the boiler of a locomotive, has more of its surface in contact with actual flame. The products of combustion pass off through the connecting flue above alluded to, and make their exit through the chimney. The gas-pipes and air-pipes are furnished with suitable stopcocks and valves, for regulating the respective quantities of air and gas necessary to carry on perfect combustion; and also for the purpose of shutting off entirely the supplies of air and gas when required.

In combination with coke the arrangement for using gas for evaporative purposes may be formed in the same manner as a locomotive boiler; with the addition of a series of horizontal tubes for the gas and air, placed underneath the other tubes, and supplied as we have before described with suitable stopcocks and valves for regulating the supply. There must, however, in this case be a double chimney; the inner one being for the tubes through which the products of combustion from the coke pass, and being constructed in the ordinary way in which these portions of locomotives are constructed; while the outer one is for the products of the combustion of the gas, which are let into it by suitable connecting flues, passing into the outer chimney in the smoke-box above the level of the boiler. In the cases of marine and locomotive engines the supply of gas would have to be condensed, and contained in suitable receivers. This could be very advantageously effected in the case of marine boilers, with a very great saving of stowage room, and in the most valuable part of the vessel; and also with a considerable increase of the strength of the vessel. The patentee proposes for this purpose to run a long pipe right along the keel of the vessel from stem to stern, for the purpose of containing a supply of condensed gas, and having also smaller pipes running along in various parts of the sides of the vessel, secured in a suitable manner to the knees of the vessel. This, he says, would strengthen the ship to a very great extent, and that this strength would be much increased by having additional pipes running down the sides of the vessel, and forming the knees. The most valuable part of the stowage room would thus be left free, and the vessel would have a supply of combustible disposed in a most convenient and advantageous manner. Of course in ordinary engines the gas would be used at the pressure of the gas works; but the patentee states that it would be the most economical plan to make the gas on the spot where it is to be used. It is necessary in these cases where vessels of condensed gas are used to have some means of keeping the gas always at the same pressure in the pipes whence it issues for burning. This is effected by the patentee in the following manner:—The gas enters the main tube from the vessel in which it is condensed through a narrow orifice. Over this orifice slides a valve, which is attached to a piston, working in a small cylinder or chamber in the reservoir. A spiral spring is fastened to the piston, and round the piston-rod in such a manner as that the pressure of the gas upon the bottom of the piston should be acted against by the elasticity of the spring. Supposing, now, that the pressure of the reservoir is at its greatest height, this pressure will drive up the piston, and consequently, by means of the rod which attaches the valve to it, will cause the valve to slide up over the hole, and nearly shut it. As the pressure becomes less, the spring forces the piston down, and consequently opens the valve to the passage of the gas. Between the entrance orifice and the branch-pipes above is a small chamber on the main pipe, which is for the purpose of equalizing the jerks that may take place, and which would doubtless cause the burning of the gas in the branch pipes to be irregular. The construction of a boiler for the combination of gas and coke, which the patentee thinks most suitable for that purpose, consists of a cylindrical boiler, with a cylindrical passage through it, having throttlers, or stops, to retard the draught. This passage is for the combustion of the coke, and has a circular fire-box at one end, and a smoke-box and chimney of ordinary construction and arrangement at the other. The gas-pipes branch off at right angles from the main pipe, which runs along the whole length of the boiler, underneath, and follow the surface of the boiler, so that the combustion of the gas from them shall heat the external surface of the boiler. The air-pipes follow the same directions as the gas-pipes; and are, in fact, arranged in exactly the same manner as described in the first arrangement we have given for the combination of the gas with the coke for evaporating. The air and gas pipes are surrounded by an outer casing which completely envelopes the boiler, and leads the products of combustion into a second chimney. This outer case will, of course, be at a high temperature; and advantage might be taken of that to heat the feed-water, preparatory to its entering the boiler. There are, as we have before described, stopcocks and valves for the regulation of the air and gas supplies.

What the patentee claims is:—

First. The method of generating steam by the use of gas alone as described.

Secondly. The generation of steam by the combination of gas with coke or coal acting in the manner described above.

Thomas Whimster, North Port, Perth, inspector of the Perth Gas-light Company, for "*improvements in the wet gas-meter.*" Registered April 12, 1851.

The gas enters the meter by a pipe in the front, but cannot gain admission unless there be sufficient water in the meter to raise the float; consequently the removal of the entrance of the bent or L pipe (by which the gas is conveyed from the front chamber back into the cylinder) from its present position to the outer edge of the meter in front of the float will serve the purpose of drawing off the water when the meter is thrown forward off the level, thus allowing the float to fall, which will prevent the admission of gas while the meter is in that position; and, secondly, the application of this pipe in an inverted position, by continuing the L pipe and bringing it over-forward to the outer edge of the meter in front of the float, thereby taking advantage of the rise of the water at that place, in consequence of the meter being thrown forward off the level; thus waterluting or submerging its entrance, which prevents the passage of gas back into the cylinder.

Miscellaneous News.

CITY COURT OF SEWERS.

April 29, 1851.

Deputy Peacock in the chair.

After the transaction of the usual weekly business, the Court proceeded to receive proposals for the supply of gas to the public lamps within the City for the term of one year, commencing on the 24th of June next.

Deputy Harrison rose and said: Before the tenders from the gas companies are received, I should wish to ask the clerk what securities are usually given for the performance of the contracts.

Mr. Daw (the chief clerk): The court have not taken any bond from either the Chartered or the City Gas Companies for the last twenty or five-and-twenty years. All the subsequent contracts have been made on the basis of the original bond.

Deputy Harrison: That is to say, that the commissioners, believing they had to deal with respectable parties, have taken their respectability as the guarantee for the due performance of their contracts.

Mr. Daw: Just so.

Deputy Lott: I should like to know why that question is now asked by Deputy Harrison?

Deputy Harrison: Because I think that the information upon this point will come better before than after the tenders are opened.

Deputy Lott: But who asked for this?

Deputy Harrison: I am an independent member of this court, and I——

Deputy Lott: So am I; so are we all.

Deputy Harrison: As an independent member of this court I am entitled to ask for any information upon subjects of business which may come before us, and I am not to be called to order when doing so, particularly when I find many gentlemen around me who are very glad that I have done so.

Deputy Lott: I have no objection to your asking for information, but I do object to your taking that as an opportunity for making a speech.

Deputy Harrison: I shall have to make a speech presently.

The Chairman here called upon the doctor who had just entered the court to make his report, which he proceeded to do.

Deputy Harrison: Is it upon the subject of gas tenders?

Deputy Lott: No, no; do compose yourself.

The Doctor having concluded, the clerk proceeded to open the tenders, while doing so—

Deputy Hall inquired whether all the parties tendering were equally capable of undertaking the whole supply of the City?

The Chairman: Have the tenders read first, and see what they are.

The Clerk read the following tenders:—"City Company, £4. 4s., batswing; ditto, £2. 14s., cock's-spur."

The Chairman (to Mr. Gray): That, I suppose, is what we are now paying?

Mr. Gray: Yes.

Chartered Company, £4. 4s., batswing; £2. 14s., three-hole burners (as heretofore).

The CHAIRMAN: Here's another tender. You are not used to having three.

The CLERK then read as follows:—

"Great Central Gas Consumers' Company's Offices,
29th of April, 1851.

"Gentlemen,—On behalf of the board of directors of the Great Central Gas Consumers' Company, I beg leave to submit a tender for lighting the public lamps of the City from sun*rise* to sunset ('Should be sunset to sunrise,' clerk) throughout the year from Midsummer next, on the following terms, namely, for batswing burners, including lighting and cleaning once a week at least, and keeping services, lanterns, and burners in repair, £3. 17s. 6d.; cock's-spur, with same conditions, £2. 13s.; laying on the services and furnishing the burners at the cost of the company; and are willing to enter into such security for the due performance of the contract as may be deemed necessary by your honourable court."

(Signed) "THOMAS DAKIN."

The CLERK: I have also a letter here from Mr. Dakin, addressed to the Honourable the Commissioners of Sewers. It is in these words:—

"Gentlemen,—When this company was in progress of formation, the directors of the old companies stated that the prices which were then, and are now, paid for public lights were less than the prime cost of the article. As we have from the commencement of our career declared that we will not enter into an unprofitable rivalry with our competitors, we think it right to offer a few remarks as to why our terms are lower than theirs for the public lights, and which we admit are also less than those of the private consumers, who, we think, are entitled to be supplied at the same prices as the public lights.

"Experience fully warrants the statement upon which our original estimates were made—namely, that the charge for gas ought to be reduced in proportion as the supply increases. We are now supplying at the rate of 250,000,000 at 4s. per 1000 cubic feet, which costs us 1s. 9d. per 1000, collected at the burners; and, as the quantity of consumption is rapidly increasing, we expect, before the term of our contract with you expires, we shall be able to make a considerable return to the private consumers, and that the price will ultimately settle down to the price we now offer for the public lights. By comparing these prices with your present contract it will be found that it will effect a saving of upwards of £800 per annum."

The CHAIRMAN (to Mr. Dakin): Are you in a position to light all the alleys and courts in the city of London?

Mr. DAKIN: Perfectly so.

Mr. WHITESIDE: I wish to ask whether the repairing, cleaning, &c., mentioned in the Great Central Gas Company's contract, is not just what the other companies are now doing?

Mr. DAW: Yes, it is.

Mr. DAKIN: I may perhaps be allowed to state that, this being the first time we have tendered for the public lights, I waited on Mr. Daw a few days ago, and learned from him the conditions required from persons tendering. These conditions I have incorporated in the tender just made.

Mr. DAW: I have not the slightest doubt of Mr. Dakin's intention to comply with all the conditions laid down by the court.

Mr. DAKIN: We shall be happy to put more in our tender if desired.

Deputy LOTT (to Mr. Daw): Is there any clause in the contracts for public lights as to the quantity of gas to be supplied, or the height of light from the burners?

Mr. DAW: Do you mean the dimensions of the flame?

Deputy LOTT: Yes.

Mr. DAW: I believe that twenty-five years ago the original contracts specified the dimensions of the lights.

Deputy LOTT: Allow me to ask Mr. Dakin whether, supposing the gas to be supplied by the Great Central Gas Company should not be equal in purity or intensity of flame to the other companies, they will be willing to give a sufficient altitude of flame to compensate for it?

Deputy HARRISON: If it should be!

Deputy LOTT: Mr. Chairman, I must protest against the indecency of my friend Mr. Harrison in the interruptions he makes on my remarks.

Mr. DAKIN: I am not willing to contemplate the contingency which the worthy deputy has suggested; but I am willing to promise that the light shall be equal by illuminating power or altitude of flame.

Deputy LOTT: Deputy Harrison may make a laughing matter of this if he likes; but I think it will be seen at six months hence that my question has had a motive.

Mr. DAKIN: It is the great object of the body which I represent that a *public* officer should be appointed to judge between the company and the public; and I shall submit a proposition to the Common Council on Friday next to carry out that view.

Mr. GRAY (for the City Gas Company) said: Sir, I am desirous of making a few observations here to-day, because it is probably the last time I shall ever be in this court. Of course I cannot but refer with feelings of the deepest regret to the manner in which the old City gas companies have been assailed both in and out of this court. Had we been a body of the most disreputable people in London, more calumnies could not by possibility have been heaped upon us. One hon. member of this court (I will not mention his name) has taken upon himself to draw a distinction between my private and my public life. He has said that, though my private character was unassailable, yet in my public capacity he could attach no value to what I said. I tell that hon. member that my public conduct is as irreproachable as my private career, and I call upon him, or any other member of this court, to put his finger upon a single act of either which will bear to be designated in the way he has spoken of it. My hon. friend yonder (Deputy Peacock) is a member of another public company to which I belong, and we often meet, and I fearlessly challenge him to say whether it is so or not. With regard to the tender just given in, I have, of course, nothing to say; still I think it due to the company which I represent to call your attention to the fact that in the first prospectus of the Great Central Gas Company the promise was made that the quality of their gas should be superior to that of our own. I will now inform you, from tests which we have made, what is the illuminating power of their gas; and I mean to affirm that the price we charge is less, taking the quality of the article into consideration, than theirs. I know that some doubt may be cast upon the meaning of the analysis which I shall lay before you. Be that as it may, I would remark that the Great Central Company have had opportunities of having their gas tested for a long while, but they have not availed themselves of them. I know that Mr. Barlow applied to them on the 4th of November last to have their gas laid on to his counting-house, but has never succeeded in getting it. The supposition is, that, as he took our gas, they were afraid that he would be contrasting it with theirs, and so they refused. We, however, have not neglected the opportunity ourselves, and the following is the result of the analysis. (Mr. Gray read a tabular statement of the comparative illuminating powers of the old and new company's gas, on several days between the 9th of January and the 27th April instant.) When you take these things into consideration (he continued), if the illuminating power of gas is to be the criterion of cheapness, then ours is the more economical of the two. I may further add that, in the communication made by the Great Central Company to their shareholders on the subject of a dividend, they advert to the subject of expenses, incurred, as they say, by "the unscrupulous opposition of the other companies." Now, I appeal to Deputy Harrison, or any other member of this court, to know whether, if the interests of his property were attacked, it would not be his bounden duty to protect it by every means in his power? I think you will admit that it would; and I have only, therefore, to express a hope that from this time these calumnious expressions will cease to be used; and, if we are to have competition one with another, let it be by fair, open, and honourable warfare. I should, for my own part, offer no hostility; my conduct shall be honourable and straightforward, for I assure you, had I consulted my own feelings, nothing like calumnious attacks should ever have been made. At the same time I feel it is a duty I owe to myself personally, and to the position which I occupy, to exert myself to the utmost to protect my property; and I shall leave no stone unturned to effect that object. With regard to the consumers, we are not yet in that state of exhaustion which it suits some people to represent, There is nothing paralytic about us, and I think there never will be. We have, as you are aware, been engaged in a negotiation with the Great Central Company for an amalgamation; it is no matter by whom originated; but if we could have come to an amicable arrangement, for the future securing peace and comfort to both, I should have been very happy, for I hate warfare of every description. Still, if we must have it, let it be carried on as between men of business and gentlemen. I hope the court will forgive my saying what I have done; I was bound to say so much in discharge of my duty to the company which I represent, as well as to myself.

Mr. DAKIN: My worthy friend Mr. Gray (if he will allow me to call him such) can never charge me with having pointed at his character reproachfully.

Mr. GRAY: No, no; I do not.

Mr. DAKIN: Mr. Gray's character for the twenty years I have known him has stood above reproach. But, on the other hand, I must be permitted to say that I, and those by whom I am surrounded, have reason to complain much more than he has; and I may remind him that the authorized member of that body to which he belongs represented me before the trustees of the Essex and Middlesex roads as solely influenced by a desire of extorting money from them. I am, however, equally willing, with himself, to let bygones be bygones. My principal object, now, is to make a remark or two upon the illuminating power of our gas. The gas supplied by the City companies before we were called into existence was, on an average, equal to 7 candles. We have it from very extensive induction, and are prepared to prove it in the proper quarter. On the other hand, our deed with this honourable court binds us to supply at an average equal to 9¼ candles, and from the tabulated statement just read by Mr. Gray we have exceeded that average.

Deputy OBBARD: No; you are a little under.

Mr. DAKIN: It may be so; but you must recollect I am taking their statement. One of the days named there was when, owing to the air getting into our pipes, the quantity was brought down to 7. But I am clear when I say that from their own statements we have supplied a higher quality than our deed binds us to. I would, however, call Mr. Gray's attention to the evidence of their own witnesses, who were taken down to our works with a hostile purpose. I will state what within the last fortnight was their testimony—they being two eminent engineers—that they found the quality according to one 12¼, and the other 13; therefore I am fully convinced that we have kept up, or rather exceeded, the standard which we purposed with this honourable court. My belief is, that the average of our gas is now 12 candles; but, whatever that may be, I am quite prepared to assure the court the matter shall be taken into our serious consideration; and, if the public service is confided to us, we will take care that it shall suffer no loss in our hands. One word about Mr. Barlow. He is the editor of the GAS GAZETTE, and his efforts have been unceasingly directed to the injury of our company. Whether he expected that we should, directly he chose to make a request, accede to his wishes, I do not know, but I put it to Mr. Gray to say whether it was fair and reasonable.

Mr. GRAY: Mr. Dakin has said that the parties he named went to their works with the concurrence of our board.

Mr. DAKIN: I said gentlemen who were trusted by your board, and shown by you to be great authorities. I was going to give names.

Mr. GRAY: You intimated that it was with our knowledge. Now, I never knew of those scientific men going as stated. It is quite true that when in Parliament we summoned these gentlemen, Messrs. Robinson and Hawksley; and it came to my knowledge quite

accidentally that they were engaged in an arbitration between the Great Central Gas Company and the contractors, Messrs. Rigby. I should be ashamed to send anybody down to your works unless I had given you an intimation on the subject. I may remind Mr. Dakin, however, on the question of the quality of their gas, that 95 of their customers have come back to us in consequence of that, and the imperfect way in which it is registered.

Mr. DAKIN: I can only say that we have not lost 95 at all; but we have been adding something like 50 per week, for a long time, of the City Gas Company's customers.

Deputy HARRISON: I beg now to move that the tender of the Great Central Gas Company be accepted, it being a saving of nearly £800 a year to the ratepayers of the city of London. I hardly know whether it is necessary to make any observations very much at length upon the subject. I am quite of opinion with the chairmen of both companies to let bygones be bygones. I wish, however, that they had made up their minds to have come to that conclusion before they made any observations in this court. I cannot help thinking——(Some interruption, and requests to the deputy not to pursue the subject). Yes—I feel that it was I who made the observation touching the chairman of the City Company that, although his private character was irreproachable, yet, as an individual, I said of him publicly that I could place no faith in what he said with reference to the proceedings of that gas company. I say so again, and I say it from positive experience; for I remember that gentleman asked me whether, as a man of business, I considered 10 per cent. was too much interest to be paid upon the capital of the City Company. I told him I thought not, and he assured me that that was the amount of dividend which they paid. I do not know with what mental reservation he made that statement; but this I know, that, in addition to 10 per cent., they have for years been dividing bonuses, the amounts of which Mr. Gray in this court refused to give me, although he admitted they were very good. Upon that single assertion, therefore, I feel justified in stating what I did; but I will not pursue the subject further, as Mr. Gray wishes bygones to be bygones.

Deputy LOTT: No; it was *your* friend Mr. Dakin who said so.

Deputy HARRISON: Well, I will refer no more to this subject unless compelled so to do. I hope for the future the business of supplying gas to the citizens of London may be done, as it has been suggested, in a gentlemanly way. We have in the present instance a duty to perform to the ratepayers and the citizens at large, and, therefore, it is our duty to accept the *lowest tender*. The old companies told us over and over again that they were supplying the public lights at a loss, and that if they reduced the price to the commissioners they must increase it to private consumers; so that I did not at all expect a reduction in the price to-day. At the same time I am not surprised at the offer by the new company to reduce the price of the public lights, because I was told that 3s. was the natural price for gas to be supplied to the citizens of London, in consideration of the large quantity distributed over so small an area. The calculations of the Great Central Company were based on that which they had every reason to believe would be the state of things, and I shall be pleased to see those expectations realized. In this instance there is a direct saving of £800 a year; and, as in every past instance the company have kept faith with the public, there is no doubt they will do so here. I have been making a little inquiry as to the difficulty of making the alteration from one company to the other, and I am happy to say that it will not make the slightest difference to us. Here, therefore, becomes manifest the great advantage of laying the pipes as the new company have done. The mains generally are laid in the pavements of the footway, quite close to the gaslamps; therefore all the disturbance will be to take up one flagstone, connect the service with the main, and in a very short space of time the majority of pipes in the City will be supplied at this great saving. I am, however, quite prepared to hear it said that we shall have the City in darkness; but to that I answer that the Consumers' Company, by way of avoiding the possibility of such a contingency, have undertaken for a few days beforehand to lay on so many hundreds per day, so as to be quite ready to take the whole of their contract on the 24th of June next. They will take upon themselves the expense of lighting the lamps for a short time before the contract, in order to secure the public from the slight inconvenience to which they might otherwise be subject.

Deputy STEVENS seconded the resolution. He said: It is a great gratification to me, an old man, after twenty-six years endeavouring to promote a reduction in the price of gas, to find that we have a third company come forward to make the proposition which they have. I will say no more than that I am sure no company has been so much calumniated as the Great Central.

Deputy LOTT: I have no doubt it is to the great gratification of Deputy Stevens in a great variety of ways. His connection with this company must be continually a source of gratification to him. Now, I feel that it would be our duty to effect a saving in the price of this article, gas, if we can at the same time secure a better article; but, if we don't do that, we shall be in a worse position than we are at present. I must take this opportunity of saying that I am obliged to take exception to the conduct of Deputy Harrison, who gets up and uses the Scotch proverb, about the paternity of which there seemed to be some little doubt in that corner awhile ago. I say he takes that proverb for a text, but he does not preach up to it; for he immediately begins to attack the venerable gentleman who has just left the room by accusing him of misrepresentation.

Deputy HARRISON: I was only defending myself.

Deputy LOTT: You attacked that gentleman by saying his statement was not borne out, at a time when you knew he had no opportunity of defending himself. Now, I say that there has not been a statement made here to-day which has been contradicted by your company, Deputy Harrison.

Deputy HARRISON: Dear me, this is very irregular. I have nothing to do with the company; I am not a shareholder in it.

Deputy LOTT: We have heard to-day that an elaborate analysis of the two companies' gas has been made by Mr. Gray, from which it appears that the new company's is very inferior. I have asked the clerk whether in the contract there will be any clause relieving us from the possible dilemma of having the streets in perfect darkness; but these gentleman think there is no chance of such a thing, from the brilliancy of their gas and the brilliancy of the parties who create it. However, as there is no security for this sort of thing, I should prefer, even at a pecuniary loss in the figures, to rely upon that company which for so long has served us well and faithfully.

After some remarks from Mr. WHITESIDE, Mr. BREWER, and Deputy BRIDGE,

Deputy HARRISON said: As to the illuminating power of the new company's gas, he wanted no better proof than this:—the churchwardens of St. Michael's, Cornhill, having seen it burning, had directed it to be supplied to the church. The parishioners, who had had no idea of the change, were surprised and delighted with the brilliancy it displayed; and his own (Deputy H.'s) experience was that he had burnt less quantity and had a better light since he had been supplied by the new company than before.

Deputy HALE: Ah, you are a favourite, and they take care that you are well supplied.

The CHAIRMAN then put the question, "That the tender of the Great Central Company be accepted," which was carried without a dissentient.

The CHAIRMAN (to Mr. Dakin): I am happy to inform you that you are the successful candidate, and I hope you will be able to perform all your promises.

Mr. DAKIN: This is only another instance of the kindness which we have ever experienced from this court. It will be both our policy and the expression of our gratitude to exert ourselves to the utmost to carry out your wishes.

The court then adjourned.

GREAT CENTRAL GAS CONSUMERS' COMPANY.

The third half-yearly meeting of the shareholders in this company was held at the London Tavern on Wednesday, April 30. Mr. Dakin, chairman of the company, presided. The following members of the board of directors were present:—Messrs. Pearson, Bennoch, Boville, Warren, Lowe, Bradbury, Virtue, and Clemow; Mr. Alderman Wire and Mr. Hardwick, solicitors to the company; Mr. Blake, Mr. Hall, Mr. Bernard, and a large number of shareholders.

The CHAIRMAN wished to inform the meeting that, before the regular business commenced, a gentleman named Pearse had stated to the directors, in an adjoining room, that he had been refused admission to the meeting. It appeared that on Tuesday last he applied to have a share belonging to Mr. Heginbottom, butcher, of Aldgate, transferred to him. The circumstances under which the application was made being unusual, the transfer was not made, and consequently Mr. Pearse was not a shareholder, nor entitled to be present. The directors would recollect the name of Pearse in connection with some advertisements which had recently appeared in the *Times*. He (Mr. Dakin) would now ask the legal adviser of the company whether Mr. Pearse was legally entitled to be admitted?

Mr. WIRE: Most assuredly not, as the share has not been transferred to him.

The CHAIRMAN: Then I want to know from the meeting whether it is their opinion that he be admitted as an act of favour.

ALL: No, no!

The secretary then read the advertisement convening the meeting, and also the report of the directors, a voluminous document, which gave a very minute history of their past proceedings, and sketched out in somewhat glowing terms their future prospects. The principal topics touched upon were the efforts made to procure an act of Parliament, and the circumstances connected with the proposed amalgamation with the City Gas Company, the negotiations on account of which had proved unsuccessful. The auditors' accounts were made up to the 18th of March, but the directors had caused the account to be carried forward to the 24th of April. The receipts on account of calls amounted to £144,480. 7s., and the calls on shares in course of collection to £5512. 13s. The shares kept back for Messrs. Rigby, to make up the 3000 which under the contract they were to take, were not now required for that purpose, as those gentlemen were not to execute the extension works. The directors had allotted the whole of those shares to other applicants. The entire receipts amounted to £143,277. 16s. 7d., and the expenditure to £130,082. 18s. 2d., leaving a balance in hand of £13,194. 10s. 4d. The various items of outlay were described as follows:—

"By amount expended at the original establishment of the company, and for charges, discount, expenses, law and parliamentary expenses, engineer, surveyor, stationery, advertising, printing, rent and taxes, &c. ..... £. s. d. 21,636 8 6

	£.	s.	d.	
Services and fittings	3,846	9	1	
Contractor for works.....	76,883	4	9	
Meters	7,789	11	0	
Furniture.....	404	5	4	
Plant.....	3,391	4	11	
Land.....	6,302	1	9	
Deposit, east end parishes	1,650	0	0	
Mr. Croll for gas.....	8,180	0	11	
				108,446 17 9
				£130,083 6 3"

The trading account showed that the total number of consumers amounted to 4450, and the rental for the quarter ending March 31 amounted to £11,002. New consumers were increasing at the rate of 50 per week, and the yearly manufacture of gas amounted

to 300,000,000 cubic feet. The leakage of gas was estimated at 16½ per cent., while that of other companies was from 20 to 30. By an agreement with Mr. Croll, the contractor, the company were only to pay for the quantity registered at the consumers' meters, allowing 20 per cent. for leakage. With respect to the dividend, it was stated that from the 29th of September there had been little profit, owing to the leaky state of the pipes. There was a profit of £5755 on the trade available for a dividend. This would pay a dividend of 10 per cent. up to December, or 5 up to March. Judging from the profits of one quarter and three weeks, the directors believed that, if no addition was made to their trade, they could sustain a dividend of 10 per cent.; but, as they had the power of making up arrears of dividend from a back period, they would now recommend a dividend of 5 per cent., to be payable on and after the 1st of June. The company's application for an act of Parliament had been referred to a committee, which was to sit on the 15th of May. The City Gas Company had threatened their opposition, but other companies were willing to enter into amicable arrangements. The report included a long correspondence between the board and the directors of the City Gas Company, on the question of amalgamation. The following communication is the most important, as it contains the whole of the points at issue:—

"*Letter from the Chairman of the Great Central in reply to the foregoing.*

"March 29, 1851.

"Gentlemen,—I am requested by the directors of this company to acknowledge the receipt of your favour of the 25th instant, covering an extract from the minutes of a joint committee of the shareholders of your company, dated the previous day, in which you propose certain new terms of amalgamation in substitution of those which were submitted to you on the 19th instant, in the form of resolutions. The report to which they were annexed was signed, as you were informed, by every member of this board, and was almost unanimously approved by the large meeting of gas consumers at the London Tavern, as well as by a committee of gentlemen nominated by them, and acting jointly with the committee of the shareholders on the previous day.

"The directors of this company inferred from your letter of the 20th instant that the report and resolutions above mentioned had been read to your meeting of shareholders, and that the principles of amalgamation contained therein had been adopted by yourselves and your shareholders as the terms and conditions of the proposed settlement. Impressed with this opinion, the directors caused notice to be given to the commissioners of sewers that they would be memorialized next Tuesday for their consent to the arrangement, and instructions were likewise given to the solicitor to prepare the necessary deeds to carry it into effect.

"The substituted plan now suggested by your board proposes a total departure from the essential principles of our report and resolutions. We are quite certain it would not be sanctioned by the shareholders or consumers, or by the commissioners of sewers, who, as the representatives of the inhabitants, hold our deed of covenant, prepared by your and their solicitor (Mr. Timothy Tyrrell), securing to the public certain vested rights inconsistent with the adoption of your present proposal. The directors, under these circumstances, are compelled to decline your present proposal, or indeed any proposal which should vary any of the essential principles of the engagements into which we have entered. The directors have committed it to me and our friend Mr. Charles Pearson to communicate to you their unchangeable determination upon this point; they are, however, ready and willing to discuss with you, in the same friendly spirit that has distinguished their recent correspondence, any modification of the minor details of arrangement that may be calculated by previous arrangement to lighten the duties of the arbitrators. In order that we may thoroughly understand each other, and avert the trouble and delay of unnecessary correspondence, we think it desirable to state, with clearness and precision, what we consider the inflexible conditions of our engagement with the shareholders, the commissioners, and the consumers, from which, if the directors were disposed to do so, they feel they could not depart without the united consent of those bodies. The conditions may be thus stated:—

"1st. The company are not to exact payment from incoming tenants for any arrears of previous occupiers which the company may have allowed to accumulate.

"2nd. The consumers are to be supplied with services free of charge.

"3rd. The company are likewise to supply meters free of cost, and are to pay an inspector, to be appointed by the corporation or the magistrates, to stamp and test the meters upon the application of any consumer.

"4th. The company are at all times to furnish to every applicant an abundant supply of gas at a fixed standard of purity and illuminating power; and the company are to pay a skiiful chemist, to be appointed by the corporation or the Board of Trade, with power at all times to enter upon the premises to test the purity and power of the gas supplied.

"5th. That the charge for gas is never to exceed 4s., and, after payment of a £10 per cent. dividend on capital, the net surplus is to be applied in reducing the price to the consumer; a public auditor is to be appointed by the corporation or the Board of Trade, to examine and publish the accounts, so as to ensure an economical administration of the company's affairs as leading to a reduction in price. For the like purpose, the shares are to be £10 each, so as to secure to a large body of consumer-shareholders a due influence in the election of directors and the general conduct of the company's concerns.

"All the foregoing terms and conditions were included in the prospectus of this company, and the deed of covenant with the commissioners of sewers. They are likewise introduced in the company's bill now before Parliament. As it was made one of the fundamental terms of our agreeing to your proposal to amalgamate, that, in order to save expense, your opposition should be withdrawn, and the bill in its present form should pass, we deemed it unnecessary to do more in our report and resolutions than make reference to the provisions of the bill as regards these particulars, confining ourselves to the all-important question of capital, and leaving the minor details and machinery for effecting the proposed amalgamation to be arranged by the arbitrators in the mode agreed upon between us.

"As your new proposal does not touch upon any of the points in the bill, we presume we may consider them as finally agreed upon, and that it is to the *amount of capital* and the *mode of valuing* the property of the two companies that our observations have been directed to show why the directors are obliged to reject your proposal.

"In conformity with the terms of our prospectus and our engagement with the consumers, the amount of capital is *limited* by our report and resolutions to *two hundred and fifty, or at most to three hundred, thousand pounds*, divided into twenty-five or thirty thousand shares of £10 each, whereas your proposal leaves it open to the arbitrators to determine the *amount of capital* of the amalgamated company.

"The consumers contend that if *we* are able and willing to enlarge our works, and to supply the entire City with gas by means of a subscribed capital of £250,000, they ought not to have the reduction of price deferred by encumbering the amalgamated company with a dividend-paying capital of an undefined amount.

"Your proposal respecting the valuation of the works involves likewise a serious departure from the principle of valuation; we proposed to leave it to gas engineers of skill and experience in their own department of science to value the buildings, plant, and pipes of each company upon a well-known principle of valuation, based upon their respective powers and capacities to manufacture, store, and distribute gas. You, on the other hand, propose 'that the arbitrators (two of them commercial men and one a barrister) shall determine, upon the evidence of competent engineers, the value of each of the UNDERTAKINGS at the present time, without reference to their original costs or nominal capital.'

"If this company had been formed, as has been often insinuated, for the purpose of making a profitable bargain with your company, regardless of our character, and reckless of the consumers' interests, your suggested plan would afford us a favourable opportunity of accomplishing this object.

"We are advised that, according to the rules of valuing gas '*undertakings*,' our works '*at the present time*,' with a good will (upon an annual consumption of 250,000,000 cubic feet of gas) attached, might reasonably be valued at £250,000; while yours, according to the amount of your supply 'at the present time,' might not be estimated at a much less sum.

"We have no desire to augment our capital in the amalgamated company by appropriating to ourselves what fairly belongs to the consumers—namely, the value of that part of *our* '*undertaking*' which is constituted of *their* 'good will.'

"If the shareholders obtain in the amalgamated company what they are now obtaining out of the actual profits of their own concern, a 10 per cent. dividend on their actual *outlay*, they think they ought to be satisfied to return the surplus to the consumers, or to apply it in reduction of price.

"If the *works* are to be valued as *works*, it is clear that the valuation can be conducted by gas engineers with much more satisfaction to the parties and the public than by troubling the arbitrators to hear their evidence. You propose to lessen their responsibility and dilute their professional judgment by tendering them as witnesses only whose evidence is to operate upon the minds of non-professional arbitrators. If the dry value of the works is to be estimated by the standard proposed by us, engineers are unquestionably the fitting judges. If you desire to introduce the value of the '*good will*' as an element in the calculation, the directors of this company, both on account of the shareholders and the consumers, decline to be parties to any such arrangement.

"If we were to yield to such a proposal, the capital of the amalgamated company might be fairly fixed by arbitrators, acting upon such a principle, at a sum which would render 4s. per thousand the minimum as well as the maximum price; and thus the clause in our bill which, in conformity with the terms of our prospectus, holds out to the public a contemplated reduction in price, would seem but as 'a mockery, a delusion, and a snare.'

"We have been thus frank and candid in stating the reasons which influence the directors in declining to acquiesce in the proposed alteration of the terms of amalgamation, in order that you may see how impossible it would be for us to recommend your new proposal to the commissioners of sewers when we go before them on Tuesday, or to the joint committee of shareholders and consumers, without whose approbation we cannot vary the arrangement as originally proposed.

"I have the honour to remain, gentlemen, yours faithfully,

"THOMAS DAKIN, Chairman."

The report concluded by stating that the board had completed an agreement with the corporation of London for lighting the City lamps on terms which would give a rental of £10,000 a year.

The CHAIRMAN, in moving the adoption of the report, observed that the correspondence between themselves and the City Gas Company, on the subject of amalgamation, had closed, and its conclusion could not have occurred at a more appropriate time. There were now present eight or ten gentlemen who, at a meeting held about a year ago, had put several questions respecting the contract for work and land and the right of way through the City. Those questions had been answered to their satisfaction, and those gentlemen could now bear testimony that all the promises which the company at its commencement held out had been fully realized. As the gentlemen representing the interests of the City had committed to the Central Company the charge of lighting the City, he thought that circumstance would satisfactorily prove that the company had both capacity and power to supply London. It would also have an effect on the committee of the House of Commons; for, if our local legislators judged the company competent, it was not likely that a committee of the Imperial Parliament would refuse that protection to a London company which they usually granted to companies in third and fourth rate towns. The principle on which they had made their calculation in the contract with the city of London was that they would charge 3s. per 1000 cubic feet. The cost to the company for producing it would be only 1s. 9d., and, taking all the necessary outlay into consideration, the company would have an annual profit on the contract of £3136. 5s. (Cheers.) The board had calculated the important question of dividend entirely from the state of their present revenue and present supply. The greater part of the first quarter of the year was not a period of productive working. They dated their productive working from the 4th of December. During three weeks of that quarter and three months of the first quarter of the year they had had the profit between the cost price of 1s. 9d. and the selling price of 4s. That profit would have enabled them to divide 10 per cent. upon the whole of the calls paid up to the end of the year, and the profits for the remainder of the year—that is, from March to December—would have amply justified the directors in declaring a dividend of 10 per cent. The directors, however, thought that by declaring a dividend of 5 per cent. they would have a rest of £1500; and, as they had the power under the act of Parliament of paying the remaining 5 per cent. to the shareholders out of the surplus proceeds, they thought it more prudent to pay but 5 per cent. at present, being fully confident of paying hereafter 10 per cent. to every one who had contributed one shilling to the funds of the company. (Cheers.) He believed the Legislature would

not, even if they had the inclination, refuse a privilege to this company analogous to what they had granted to companies in other towns. Mr. Hume and the *Times* newspaper had employed arguments respecting the supply of water which could be equally used with respect to the supply of gas. The *Times*, in a leading article, said:—

"We say that no possible claims of the companies can be superior to the indefeasible right of the public to be supplied with the best of water at the lowest cost. If the public, by its proper representatives, has so committed itself in times past as to entitle the water companies to some acknowledgment, let the case be made out, but let this be a separate consideration entirely. The first thing desirable is that water of the best procurable quality, and in unlimited quantity, should be brought into every street, court, and dwelling-house, at rates within reach of the poorest. We know this can be done, and there should be no delay about the business. If the companies can enter the field on these terms with any advantages from their former capacity, let them make the best of their case. If not, let them prove the grievance they suffer in being superseded by others. But that they should allege a right of impunity and prerogative in these days of free trade and open dealing is a presumption too monstrous to be endured. Is not every speculation liable to the improvements of the age? What became of stage-waggons when canals rose in favour?—what of coaches, inns, and posting-houses when railways came into use? What became of Smithfield, and the privileged trade of Long-lane and Snow-hill? Take a more recent example—one, indeed, so pat to the purpose that it is surprising how it can fail of its moral. The old gas companies possessed interests in the metropolis as large and surely as sacred as those of the water traders. They supplied an article much inferior to what might have been produced at a price much higher than was warranted by circumstances. They had large vested capitals, enormous machinery, costly apparatus, and numerous retainers, and yet they have been compelled to give way before rivals who simply promised better gas for less money."

He would now move the adoption of the report.

The motion was carried unanimously.

Mr. Blake said a resolution had been placed in his hand which he was sure would meet with their cordial assent. It was only within the last few days that he had been entitled to the privilege of attending a meeting of shareholders, but it was not unknown to many present that he had rendered some small services to the company, and those services were not at all impaired by his public efficiency in the character of commissioner of sewers. In order to keep his opinions and practice in his public capacity perfectly unassailable, he had for a long time abstained from becoming a shareholder. In any support he had given to the company he had been solely influenced by a desire to have his fellow-citizens supplied with good and cheap gas without prejudice to the rights of any party. He had been a member of the City of London Company, and he regretted that they had positively and indignantly refused to afford this advantage to the people of London. The public were, therefore, justified in obtaining it for themselves; and it was improper, unjust, and unwarrantable on the part of the City Gas Company to say that the public had not a right to do so. (Hear, hear.) He had great pleasure in moving—

"That the hearty thanks of this meeting be given to the chairman, deputy-chairman, and the directors, to Charles Pearson, Esq., honourable director, to A. A. Croll, Esq., the talented engineer, and to the other officers of the company, for those zealous and judicious exertions whereby, sustained by the active and steady support of the shareholders and the gas consumers, and aided by the co-operation of their committees, the Great Central Gas Consumers' Company has attained to the prosperous condition developed in the report this day approved."

Mr. Lupton, in seconding the motion, advocated the right of the people of London to local government, and hoped all parties would assist in the breaking down of monopoly of every kind. He liked to have food cheap, gas cheap, every thing cheap. (Cheers.)

The motion was then put and agreed to.

The Chairman and Mr. Croll having severally thanked the shareholders for the respect and confidence towards them and the board of directors expressed in the resolution,

A Shareholder inquired why the entire correspondence had not been printed and placed in the hands of the shareholders at an earlier period?

The Chairman said the last letter was dated the 15th of April, and it was impossible to prepare it sooner.

Mr. Webber moved that the audited accounts be printed and circulated among the shareholders.

Mr. Snogswell seconded the motion, and it was carried unanimously.

Mr. Bernard moved that the joint committee continue to co-operate with the board of directors until the next general meeting in promoting the interests of the company.

Mr. Simmons seconded the motion, and it was carried *nem. con.*

Mr. Larby moved—

"That a committee be requested to open a communication with the Chartered and City Gas Companies, apprising them of the enormous amount of property squandered in parliamentary expenses; and also apprising them of the threats put forth, both verbally and in writing, by Mr. Timothy Tyrrell, solicitor, for the purpose of placing this company in the whirlpool of litigation."

He could not account for the apathy of gentlemen having large stakes in the City Company to allow their directors to squander their money in opposing the Great Central Company after the very fair terms for an amalgamation that had been proposed.

Mr. Webber, in seconding the motion, observed that, when the shareholders of the City Company had learned that they had lost their best customers by the misconduct of the directors, they were very likely to be aroused by a sense of the unfortunate position in which they were placed. It was to him a matter of extreme regret that any body of mercantile men should so recklessly squander the money of others in a foolish opposition which must ultimately end in failure. He seconded the resolution, because he still wished to afford the City Company an opportunity of retracing their steps, and amalgamating with the Central Company on the terms proposed.

The motion was then put to the meeting, and negatived by a large majority.

On the motion of Mr. Rowe, seconded by Mr. T. Hall, the following resolution was unanimously agreed to:—

"That the committee be also requested to address the merchants, bankers, and other great capitalists, as well as the various public authorities and commercial establishments, of the City, explaining to them that the shareholders have invested £150,000 in the formation of the company and the establishment of their works, and praying them to concur with the shareholders in petitioning Parliament to pass this company's bill for the purpose of giving additional security to capital embarked by seven hundred of their fellow-citizens in a laudable, useful, and successful undertaking, and also for the purpose of enabling the consumers, by statutory penalties, to secure purity, abundance, and cheapness, by the appointment of independent public officers to test the regularity of the meters supplied by the company, and to prove the standard quality and illuminating power of the gas furnished as well for the private as for the public lights."

The Chairman was happy to inform the meeting that fifty-nine members of the Common Council had put their signatures to a requisition to the Lord Mayor to call a meeting for the object stated in the resolution.

Mr. Charles Pearson said they had to wage war with rival gas companies, and this war must prove injurious if the usual course were pursued. He would recommend that, instead of trying to untie the knot by the usual course, they would cut it. (Laughter,) Instead of waiting to the 15th of May to petition Parliament, he thought they should do so at once. If they presented a petition to the House of Commons complaining that the rival companies were abusing the House and the privileges of Parliament, and that the House of Commons listened to that representation, it was not improbable that they would appoint a select committee to inquire into the circumstances of the case. However disposed he might be from professional feeling to see attorneys well paid for their services, he was unwilling to see £7000 or £8000 of the company's money expended in another struggle through the committees of both Houses. In order, therefore, to prevent a protracted and expensive struggle, he would move—

"That the committee be likewise requested to prepare and print a petition to Parliament, praying for an inquiry into the conduct of the rival gas companies in opposing this company's bill, whereby a large amount of public money has been squandered in perverting the forms of parliamentary proceedings, for the purpose of causing the directors of this company to comply with the terms of an amalgamation unfavourable to its interest."

Mr. Blake: What would be the advantage of adopting that resolution?

Mr. C. Pearson: If you get a select committee the nation will pay all the expenses, the committee being appointed to prevent an infringement of the privileges of Parliament and an outrage on the interests of the community.

Mr. Barnard seconded the motion, and it was agreed to.

Mr. Pearson said a gentleman not then present had communicated to him (Mr. Pearson) that he intended to move a resolution to the following effect:—"That the company chalk up behind the door any expenses they might be exposed to in consequence of the wilful opposition of the rival company; and, whenever the rival company comes to knock at the door to ask for an amalgamation, to tell them there is a little bill to be presented for payment first." (Laughter.) He thought the adoption of such a resolution was well calculated to prevent those talkings about amalgamation. Mr. Croll, the engineer, had given notice to the directors that it was necessary for him to give orders for the enlargement of the works, so that, if in a month's time the City Company came to them with their old tin pots after the Great Central had provided themselves with new ones, no proposition could be accepted that did not compensate for the unnecessary outlay incurred by delaying the amalgamation. (Hear, hear.) He did not like to meet them with that argument a month hence, and therefore he apprised them now of the circumstance that they might be prepared. The resolution which the meeting had negatived he thought would have produced a considerable effect in the same direction; but as that had been rejected, and as we should say nothing but good of the dead, he would make one observation in favour of that dead resolution. He thought it would have the effect of inducing the shareholders of the City Company to turn round upon the directors and propose to turn them out and place some less bellicose gentlemen in their stead. (Hear.) He thought that if some friendly communication had taken place between the committees of both companies, and the shareholders had been allowed to discuss the matter with them, an amicable and advantageous arrangement might have been made. He thought it very possible that lawyers, engineers, secretaries, and other officials might be, for their own private advantage, keeping the companies at arms' length. If that were so, the shareholders were the victims, they suffered from a continuance of the conflict, and he thought the resolution which had been rejected might have had the effect of preventing estrangement. He hoped some gentlemen would now move a resolution to the effect he had stated in the commencement of his observations. (Hear.)

Mr. Hall then moved—

"That the directors be recommended to keep a separate account of any loss they may sustain from delay and expense arising from the opposition of the City Gas Company, and they be respectfully requested to reject any future overtures that may be made for an amalgamation, unless accompanied by an offer to pay the amount of the loss and expense to which they may be subjected by the threatened opposition."

Mr. Jay seconded the motion, and it was carried unanimously.

The Chairman announced that a vacancy in the board of directors, occasioned by the resignation of Mr. John Hunt, had been filled, in conformity with the deed of settlement, by electing Mr. G. Virtue, subject to the approval of the shareholders. He had already rendered essential service to the company, and his position at their board would be highly conducive to the interests of the company.

The question that he be elected was then put and carried by acclamation.

Bertram Wodehouse Currie, Esq., was elected an auditor of the company, in the place of George Virtue, Esq., elected a director.

The Chairman announced that a dividend be declared from the period of the payment of calls up to the 21st of March last of 5 per cent., clear of the income-tax, and to be payable on and after the 21st of June next; after which it was resolved that the proceedings of this meeting be advertised in the usual morning and evening papers.

The usual vote of thanks having been given to the chairman the proceedings terminated.

Patents Recently Granted.—Thomas Greaves Barlow, of 32, Bucklersbury, in the city of London, civil and consulting gas engineer, and Samuel Gore, of Park-road, Old Kent-road, in the county of Surrey, engineer, for "improvements in the treatment of certain substances used in the production of gas, for giving light and heat, and of some of the products of the said substances, as also in the apparatus employed in the manufacture of such gas, and in discharging and giving motion to gas." Patent dated April 15.

William Smith, of Snow-hill, in the city of London, gas-meter-maker, and Thomas Phillips, of Brighton, in the county of Sussex, gas-fitter, "for certain improvements in apparatus for heating, ventilating, and cooking by gas." Patent dated April 24.

Improved Gas Cooking Stove.—The ordinary method of applying heat to cooking is perfectly barbarous. Immense furnaces are kept up in gigantic kitchen-ranges, of which the object seems to be to produce the smallest possible result at the greatest possible cost. The health of the cook is injured by the intertropical heat maintained. The whole dwelling-house is pervaded with clouds of subtle soot, coal, and ashdust, and consequently the paint, furniture, clothing, linen, and the very surface and indentations of the human frame are discoloured and begrimed. We have been induced to make these remarks from an opportunity offered us of inspecting a very novel and ingenious apparatus, invented by Mr. Goddard, the engineer to the gas company in this town, and which has now been forwarded to the exhibition of gas apparatus at the Polytechnic Institution. It will, by means of gas, perform the several operations of roasting, baking, steaming, broiling, boiling, stewing, and frying, and, indeed, every variety of culinary operation, with unprecedented cleanliness, comfort, and economy. It is in form a square pedestal, 15 by 18 inches, with a bold entablature, 24 by 24 inches, and is three feet high. The roasting, baking, and boiling take place in a well-ventilated chamber lined with porcelain, the non-conducting and reflecting properties of which render this mode of cooking very economical. The boiling, steaming, stewing, or frying can be carried on simultaneously with the roasting, and are performed on the top of the apparatus, which is provided with three coil burners of an ingenious construction. One of these burners is so arranged as to be available for the heating of irons for laundry purposes. The whole apparatus presents a unique, chaste, and compact appearance.—*Suffolk Chronicle.*

Magisterial Interference with the Laying of Service-pipes.—A summons obtained by the commissioners for paving the parish of St. James, Westminster, against the Equitable Gas Company, for breaking up pavement, was recently decided by Mr. Bingham, at the Marlborough-street Police Court, and as the point involved,—namely, the right of gas companies to lay down any new pipes without the consent of the local outhorities,—is one of very great importance with reference to the whole of the metropolis within the operation of Michael Angelo Taylor's Act, we are glad to be able to give the magistrate's decision verbatim. Mr. Bingham said, "The statute 5 Vic. sess. 2. c. xxxvi. secs. 154, 205, empowers the Equitable Gas Company, subject to the rights, powers, or provisions of the General Paving Act, 57 Geo. III., c. 29, to lay down or alter 'such pipes' as may be necessary for lighting with gas certain parishes in the city of Westminster. The General Paving Act, s. 11, enacts that no gas company shall break up the pavement of any street 'for the purpose of laying down any new mains or pipes' without the consent of the commissioners of the pavements, and three days' notice to their surveyor before such pavement shall be broken up. But, under that section, any gas or water company may, without such consent, break up the pavement 'for the purpose of altering the position of, or repairing, any pipes, or of substituting iron for wooden mains or pipes,' provided notice be given to the surveyor within twelve hours after such company shall begin to break up the pavement. The Equitable Gas Company has recently broken up the pavement, without the consent of the commissioners, for the purpose of laying down a service-pipe from the main in Coventry-street to a single house situated at a considerable distance up another street, and, being summoned to the Police Court for the penalty imposed by the General Pavement Act for every square foot of pavement broken without the consent of the commissioners, contends that the penalty is applicable only to the laying down of mains without consent, and does not apply to service-pipes; that, though it cannot be said that a service-pipe is not a pipe, yet that the word pipe is employed in the General Pavement Act sometimes in a wide, sometimes in a narrow, sense, and that the particular meaning intended in each instance must be deduced from a careful examination of the whole of the context: that in the expression 'mains or pipes' in the 11th section the word pipes must be taken as redundant or as explanatory of the word mains, that is to say, mains, or pipes which serve the office of mains; that the 12th section, which regulates the construction of pipes, gives directions touching all new 'mains or pipes,' whether such new 'main of pipes' shall or shall not be added to any other 'mains of pipes,' and prescribes that the pavement shall not be broken up in December, January, or February, for the purpose of laying down any new 'main of pipes,' and that, therefore, the word 'or,' in the 11th section, is probably a misprint for "of;" a suggestion which might have been verified by inspecting the roll of Parliament; and lastly, that, as public convenience requires that they who, on a sudden, may have need of a service-pipe to light their premises should not wait three days for the consent of the commissioners, the Legislature could only have employed the word 'pipes' in the 11th section to mean something in the nature of a main-pipe. The argument from public convenience cuts both ways; for it is at least as inconvenient that a highway should be unseasonably blocked up, as that an individual should wait three days for light. And it seems a dangerous principle of construction to narrow the plain and obvious meaning of a word embracing many particulars, by conjectures drawn from the use of the same word in company with different adjuncts. On the other hand, a careful analysis of the whole of the 11th section rather leads to the inference that, with reference to the consent of the commissioners of pavements, the distinction was intended, not between main and service pipes, long and short, wide and narrow pipes, but between new pipes to be laid down and pipes already laid down, for the purpose of altering, repairing, or substituting, the companies may break up pavements without consent, whether the pipe to be repaired be main or service pipe; for the purpose of laying down 'any new mains or pipes,' that is, any new pipes whatever, they must begin with obtaining the consent of the commissioners. There is, however, such a want of precision and consistency in the language of the act, that I find it impossible to come to any satisfactory decision; and my difficulty is increased by the judgment pronounced on a former occasion by my colleague on this bench after a careful examination of the whole subject. The reasons given by him for that judgment are entitled to much consideration, and it would be a strong step to impose a penalty on the defendants, who, for eight years, have been acting on that decision. The question is one of such nicety, and, as between two great public bodies, of such importance, that it seems scarcely decorous to rest the settlement of it on the opinion of a single police magistrate. It can only be satisfactorily set at rest by one of the superior courts at Westminster; and, if the defendants will concur with the complainants to take steps for obtaining a decision in that quarter, I will suspend my judgment on this summons until such decision shall have been obtained; if not, shall proceed to convict in the smallest penalty that will suffice to raise the question."

THE GOVERNMENT PATENT LAW AMENDMENT BILL.

The bill introduced by Earl Granville looks very much like a copy of that which Lord Brougham, a few days previously, laid before the House of Peers; indeed, if his lordship can be supposed to have any "copyright" in his bill, there is no question that a violation of the statute in that case made and provided has been committed by the framers of the new bill. So palpable is the imitation that, although it is provided by No. 2 bill that the petition for the patent shall be left at the Home-office, yet the fee is directed to be paid at the Great Seal-office; this blunder arising from the copy made of Lord Brougham's bill, wherein he directs the petition to (and, of course, the fee to be paid at) the Great Seal-office. We presume, however, that the noble lords, Granville and Brougham, laid their heads together, but, unable wholly to agree, two bills became inevitable. One must go to the wall; we should, therefore, endeavour to discover which should yield precedence. Bill No. 2 differs from No. 1 chiefly in these respects:—1st, that the petition is to be left at the Home-office as usual, and reported as usual; 2nd, that a statement in writing is required to be deposited at the time of leaving the petition; 3rd, that provisional protection may be obtained on depositing a statement of the invention, which protection may be extended, so as to continue in force for a year, and may afterwards be extended to a patent; 4th, the fees proposed to be taken are somewhat lower than those named in No. 1; lastly, the new bill does not propose to print specifications:—

"Whereas it is expedient to amend the law concerning letters patent for inventions: be it enacted by the Queen's Most Excellent Majesty, by and with the advice and consent of the Lords spiritual and temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:—

"1. The Lord Chancellor, the Master of the Rolls, her Majesty's principal Secretaries of State, her Majesty's Attorney-General for England, her Majesty's Solicitor-General for England, the Lord Advocate, her Majesty's Solicitor-General for Scotland, her Majesty's Attorney-General for Ireland, and her Majesty's Solicitor-General for Ireland, for the time being respectively, together with such other persons as may be from time to time appointed by her Majesty, as hereinafter mentioned, shall be commissioners of patents for inventions; and it shall be lawful for her Majesty, from time to time, by warrant under her royal sign manual, to appoint such other persons as she may think fit to be such commissioners as aforesaid; and every person so appointed shall continue such commissioner during her Majesty's pleasure; and all the powers hereby vested in the commissioners may be exercised by any three or more of them, the Lord Chancellor or Master of the Rolls being one.

"2. It shall be lawful for the commissioners from time to time after the passing of this act to make such rules (not inconsistent with the provisions of this act):—

"Concerning applications for letters patent for inventions;

"The statements to be left with petitions for such letters patent, and the making and issuing of such letters patent;

"For determining what condition such letters patent shall be granted subject to;

"Concerning the deposit in duplicate of specifications, disclaimers, and memoranda of alterations;

"For appointing or providing and regulating the office or place of deposit of specifications, disclaimers, and memoranda of alterations;

"Concerning the manner and form in which specifications, disclaimers, and memoranda of alterations shall be written, and the filing, preservation, and publication of specifications, disclaimers, and memoranda of alterations;

"For and concerning the preparation and publication of indices thereto;

"The access of the public to specifications, disclaimers, and memoranda of alterations and copies thereof; and

"All other matters and things which, under the provisions herein contained, are governed by or subject to the rules of the commissioners, as may appear to the commissioners necessary and expedient for the purposes of this act; and all such rules shall be laid before both Houses of Parliament within fourteen days after the making thereof, if Parliament be sitting, and, if Parliament be not sitting, then within fourteen days after the next meeting of Parliament.

(*Continued on last page but one.*)

Share List.

THE PRICES QUOTED ARE THOSE AT WHICH THE LAST SALES HAVE BEEN MADE.

The Companies whose names are printed in italic type are incorporated by Act of Parliament.

Number of Shares issued.	Amount per Share £	Name of Company.	Amount paid up per Share £ s. d	Dividend per Cent. per Ann. £ s. d	Price. £ s. d
		ENGLAND.			
		Aberdare			
		Aberystwith			
		Abingdon			
		Accrington £7000		5 0 0	
		Albrighton			
		Alcester			
		Alford, Lincolnsh.			
		Alfreton			
		Alnwick			
		Alston Moor			
250	10	Alton	10 0 0	5 0 0	10 0 0
800	5	Altrincham	5 0 0	4 0 0	
		Amlwch			
160	10	Ampthill	10 0 0	5 0 0	10 0 0
350	10	Andover	10 0 0	6 0 0	11 0 0
		Appleby			
		Arundel			
		Ashbourn, Derby			
		Ashburton			
		Ashby-de-la-Zouch			
		Ashford, Kent			
		Ashton Lan £39,700		10 0 0	
		Atherstone			
		Axminster			
225	20	Aylesbury	20 0 0	5 0 0	21 0 0
		Aylsham, Norfolk			
		Bacup, Yorkshire			
		Bakewell			
		Baldock			
140	25	Banbury	25 0 0		
		Bangor			
500	5	Barking, Essex	4 10 0	5 11 0	5 0 0
250	10	Barnard Castle	10 0 0	5 10 0	10 15 0
		Barnet			
		Barnsley £6000		7 10 0	
100	20	Barnstaple	20 0 0	7 10 0	25 0 0
		Barton			
120	25	Basingstoke	25 0 0	8 0 0	28 0 0
2400	20	*Bath*	16 0 0	6 0 0	25 to 30
		Battle £2000		6 0 0	
56	26½	Bawtry	26 10 0	5 0 0	25 0 0
		Beaumaris			
		Beccles, Bungay, and Lowestoft			
		Bedford			
		Bedworth			
		Belford			
		Bedale, Yorkshire			
		Belper			
		Beminster			
		Berkhempstead			
700	5½	Berwick-on-Tweed	5 10 0	6 8 0	5 15 0
		Beverley			
		Bewdley			
280	10	Bideford	10 0 0	6 0 0	10 10 0
		Biggleswade			
160	10	Bicester	10 0 0	5 0 0	10 0 0
		Bilston £15,100		6 10 0	
		Billericay			
		Bingley £7400		4 0 0	
		Birkenhead £70,000	35 0 0	3 0 0	32 to 34
2400	50	*Birmingham and Staffordshire*	50 0 0	8 0 0	93 to 94
	25	*Ditto*, new shares	7 10 0	8 0 0	12 0 0
704	75	*Birmingham*	75 0 0	9 0 0	139 to 141
		Bishop's Auckland			
		Bishop's Stortford			
		Blackburn £30,000		10 0 0	
		Blandford			
		Blythe			
		Bodmin			
		Bognor			
		Bolton £38,582		9 19 5	
		Boroughbridge			
		Boston £8000		10 0 0	
200	10	Bourn	10 0 0	5 0 0	
		Brackley			
		Bradford, Wilts			
		Bradford, Yorksh. £45,000		9 10 0	
		Brampton, Cumb.			
		Brandon, Suffolk			
		Brecon			
		Bridge-end, Glam.			
		Brierly Hill			
2250	20	*Brighton*	20 0 0	5 0 0	14 to 15
1125	20	„ new shares	16 0 0	5 0 0	
		Brighton and Hove £50,276			
4250	20	*Bristol*	20 0 0	9 0 0	37 0 0
1725	25	*Bristol and Clifton*	25 0 0	6 0 0	25 0 0
		Brixham			
		Braintree			
750	50	*Brentford*	50 0 0	6 0 0	44 to 46
800	25	„ new shares	11 0 0	6 0 0	11 0 0
		Brentwood			
		Bridgwater £6000		5 0 0	
400	10	Bridlington	10 0 0	5 0 0	10 0 0
		Bridport			
		Brigg			
		Broadstairs			
100	50	Bromley, Kent	50 0 0	6 0 0	52 10 0
		Bromsgrove			
		Broughton			
120	10	Bruton	10 0 0	4 0 0	8 0 0
100	25	Buckingham	25 0 0	5 0 0	25 0 0
		Bungay (see Beccles)			
		Burford			
		Burnley £19,946		4 10 2	
		Burslem			
		Burton-on-Trent			
		Bury, Lanc. £6570			
		Bury St. Edmund's £10,500		5 0 0	
		Buxton			
		Callington			
		Calne, Wilts			
		Camborne			
		Cambridge £34,560		9 0 0	
240	50	*Canterbury*	50 0 0	6 0 0	
240	25	*Ditto*, second issue	25 0 0	6 0 0	57 to 58
		Cardiff £12,000		7 10 0	28 to 29
		Carmarthen			
		Castleford			
		Chapel on the Frith			
		Chard			
		Chatham (see Rochester)			
		Chatteris			
		Cheadle			
		Chelmsford			
		Cheltenham £18,732		8 10 0	
		Chepstow			
		Chertsey			
230	10	Chesham, Bucks	10 0 0		
		Chester			
		Chester-le-Street			
		Chesterfield £13,123		4 17 6	
240	25	Chichester	25 0 0	6 0 0	30 0 0
		Chippenham			
		Chipping Norton			
		Chirk			
		Chorley			
		Chudleigh			
		Cirencester			
		Clifton (Bristol and			
		Cleckheaton, York.			
		Clitheroe			
		Cockermouth			
		Colchester			
		Collumpton			
		Colne, Lancashire			
		Coleford, Gloucest.			
		Coggeshall			
		Congleton £5000		5 0 0	
		Cowbridge			
800	25	*Coventry*	25 0 0	6 0 0	20 0 0
		Cowes			
		Crewkerne			
		Croydon ... £20,000		5 0 0	
		Cranbrook ... £1900		5 0 0	
		Crediton			
		Crewe, Cheshire			
		Cricklade			
		Darlaston			
		Darlington			
250	20	Dartford	20 0 0	7 10 0	27 0 0
		Dartmouth			
125	20	Daventry	20 0 0	6 0 0	24 8 0
		Dawley, Shrop.			
		Dawlish			
		Dedington			
500	6	Denbigh	6 0 0	5 0 0	6 0 0
820	10	Deptford	10 0 0	5 0 0	4 10 0
325	50	*Derby*	50 0 0	10 0 0	
90	20	Dereham (East)	20 0 0	4 10 0	
1000	5	*Dewsbury*	5 0 0	10 0 0	8 12 6
		Devizes			
4000	5	*Devonport*	5 0 0	6 0 0	6 5 0
		Doncaster			
280	25	Dorchester	25 0 0	5 0 0	30 0 0
120	25	Dorking	20 10 0	5 0 0	21 10 0
		Douglas, Isle of M.			
209	56½	*Dover*	56 10 0	4 15 4	55 0 0
		Downham			
		Driffield			
		Droitwich			
600	20	*Dudley*	20 0 0	4 0 0	15 to 16
		Dunmow			
		Dunstable			
		Durham			
276	9	Dursley, Gloster	9 0 0	5 10 0	8 0 0
		East Grinstead			
		Elland			
		Ellesmere			
		Enfield			
300	19	Epsom and Ewell	19 0 0		
		Evesham			
		Exeter £40,000		10 0 0	
		Exmouth			
		Eye, Suffolk			
64	25	Fakenham	25 0 0	5 0 0	25 0 0
		Falmouth			
		Fareham			
120	25	Farnham	25 0 0	10 0 0	42 0 0
		Farringdon			
		Faversham			
		Ferrybridge			
		Fleetwood			
		Folkestone			
		Fowey			
240	5	Framlingham	3 10 0		
		Frome			
		Garstang			
		Gillingham, Dorset			
		Glastonbury			
		Glossop ... £10,000		9 0 0	
		Gloucester £25,000		7 10 0	
		Gomersal			
		Godalming			
		Gosport			
		Grantham			
1000	20	Gravesend	20 0 0	5 0 0	21 0 0
1000	10	*Great Grimsby*	8 0 0	8 0 0	10½ to 11
	25	Guildford	25 0 0	4 0 0	20 0 0
		Guisborough			
		Hadleigh			
		Hales Owen			
300	6	Halesworth	6 0 0	7 10 0	5 10 0
		Halifax £15,000		10 0 0	
		Halstead			
		Hampton Court			
		Harrogate £10,000		5 0 0	
		Hartlepool £15,137		7 10 0	
		Haslingden, Lansh.			
330	50	Hastings and St. Leonard's	50 0 0	6 0 0	60 0 0
		Haverfordwest			
		Haverhill			
		Haworth, Yorks.			
		Hayle			
		Helstone			
		Hemel Hempstead			
300	10	Henley-on-Thams.	10 0 0		
		Hereford £5300		4 0 0	
		Herne Bay			
270	10	Hexham	10 0 0	7 0 0	12 0 0
		Heywood £10,000		5 0 0	
		Highworth (Wilts)			
230	10	Hinckley	10 0 0	5 0 0	7 0 0
		Hindley, Lancash.			
		Hitchen			
		Hythe			
		Hoddesden			
		Holbeach			
		Holmfirth £8880		3 10 0	
		Holyhead			
		Holywell (see British Provincial)			
		Honiton			
		Horncastle			
10		Houghton-le-Sprg.	10 0 0	8 0 0	
		Horsham			
		Howden			
		Hull, Sculcoats (see British Provin.)			
		Hull, £11,712. 10s.		5 0 0	
		Hunmanby			
210	10	Hungerford	10 0 0	5 0 0	10 0 0
		Huddersfield			
520	5	High Wycombe	5 0 0	6 0 0	5 0 0
		Ilminster			
		Ilford			
		Ilfracombe			
		Ironbridge			
1400	10	*Ipswich*	10 0 0	8 0 0	15 0 0
1400	10	„ new shares	5 0 0	8 0 0	
800	25	*Isle of Thanet* (Ramsgate&Mar.)	20 0 0	5 0 0	20 to 21
		Kendal £9100		8 15 0	
		Kenilworth			
		Keswick			
		Kettering	25 0 0	5 0 0	25 0 0
100	25	*Kiddermins.* £10000		5 0 0	
		King's Langley			
		Kington, Hereford			
		Kirkby Lonsdale			
		Kirkham, nr. Preston			
		Knutsford			
		Lancaster			
		Llanelly £3000		5 0 0	
		Llandovery			
		Leamington Priors £22,500		6 0 0	
		Leatherhead			
		Ledbury			
		Leeds Old Comp. old stk., £60,300		10 0 0	
		new „ £23,775		6 0 0	
		Leeds New £60,000		10 0 0	
		Leek			
		Leicester ... £36,230		7 0 0	
		Leigh			
125	20	Leighton Buzzard	20 0	5 0 0	
		Leominster			
		Leyburn, Yorksh.			
		Liskeard			
330	25	Lewes	25 0 0	5 0 0	23 0 0
		Lincoln £8000		10 0 0	
		Leyland, Lancash.			
		Littlehampton			
250	20	Lichfield	20 0 0	7 10 0	27 10 0
		Liverpool United	100 0 0	9 0 0	174 to 176
		„ ¼ sh.	25 0 0	9 0 0	43¼ to 43¾
		Langport			
		London Comps.—			
5000	40	*British*	18 0 0	5 0 0	12 to 13
		„ debentures £16,300		4 0 0	
5000	20	„ Provincial—(Gloucester, Holywell, Hull, Norwich, Stoke, Trowbridge)	20 0 0	7 0 0	18½ to 19½
	20	„ Prov., new	8 0 0	7 0 0	5 to 7
	25	*Commercial*	25 0 0	6 0 0	23½ to 24½
	25	„ new shares	15 0 0	6 0 0	part to dis
	25	„ „	2 10 0	6 0 0	part to dis
12,000	50	*Chartered*	50 0 0	6 0 0	45 to 47
6000	50	„ new shares	10 0 0	6 0 0	9 to 9½
2000	150	*City of London*	150 0 0	4 0 0	140 to 150
4000	50	*Equitable*	50 0 0	2 10 0	29 to 30
		„ debentures £46,000			
10,000	20	European—(Amiens, Boulogne, Caen, Havre, Nantes, and Rouen)	20 0 0	5 0 0	13 to 14
	20	„ do. new	5 10 0	5 0 0	4 to 4¼

Number of Shares issued.	Amount per Shar	Name of Company.	Amount paid up per Share	Dividend per Cent. per Ann.	Price.
	£		£ s. d	£ s. d	£ s. d
15,000	10	Gt.Cntl.Consumers	10 0 0	5 0 0	
8000	50	*Impl.Continental* —(Amsterdam, Aix-la-Chapelle Antwerp, Berlin, Bordeaux, Brussels, Cologne, Frankft., Ghent, Haarlem Hanover, Lille, Marseilles, Rotterdam, Toulouse, Vienna)	42 0 0		40 to 45
7000	50	„ new shares	41 0 0		50 to 55
	50	„ third issue	42 10 0		40 to 45
10,000	50	*Imperial*	50 0 0	6 0 0	69 to 71
3000	50	„ new shares	35 0 0	6 0 0	50 to 52
		„ debentures £50,500			
4000	40	*Independent*	40 0 0	6 0 0	41 to 42
3000	50	*London*	50 0 0		7 to 9
6000	25	„ preference	7 10 0	6 0 0	7¼
3000	50	„ 2nd do.	50 0 0		18 to 20
9000	50	*Phœnix*	49 0 0	4 10 0	27 to 28
1000	100	*Ratcliff*	90 0 0	5 0 0	58 to 60
4000	25	*South Metrop.*	25 0 0	6 0 0	23 to 24
9000	50	UnitedGeneral— (Cork, Dublin, Limerick)	50 0 0	2 0 0	15 to 15½
12,500	20	Western	18 0 0		7 0 0
		Lostwithiel			
		Loughborough			
240	25	*Louth*	25 0 0	6 0 0	26 10 0
		Lowestoft (see Beccles)			
611	5	Ludlow Union	5 0 0	6 0 0	5 0 0
		Luton			
		Lutterworth			
		Lyme Regis			
		Lymington			
		Malmesbury			
		Macclesfield 32,000		3 15 0	
		Maidenhead			
300	50	*Maidstone*	50 0 0	10 0 0	90 0 0
		Maldon			
		Marlborough			
		Malton (New)			
		Malvern			
		Manningtree			
		Mansfield £5000		10 0 0	
		March			
		Margate(see I. of T.			
		Market Deeping			
		Market Drayton			
132	25	Market Harboro'	25 0 0	6 0 0	30 0 0
		Market Raisin			
		Market Weighton			
		Marlow			
370	10	Maryport	10 0 0	6 0 0	12 0 0
		Melksham			
		Melton Mowbray			
		Merthyr Tydvil			
		Mere			
		Middleton £9033		5 0 0	
		MidsummerNorton			
		Middlesboro'			
		Mildenhall			
		Mitcham			
		Mold			
700	10	Monmouth	10 0 0	5 0 0	
		Monk Wearmouth			
		Moreton in Marsh			
		Morley			
		Mottram			
		Nantwich			
		Neath			
		Needham Market			
		Newark £5000		10 0 0	
250	20	Newbury	20 0 0	5 0 0	20 0 0
13,000	5	Newcastle & Gateshead Union	5 0 0	8 0 0	6 12 6
		Newcastle-under-Lyne £6200		4 0 0	
600	5	Newmarket	5 0 0	6 0 0	5 0 0
		Newnham, Glost.			
		Newent			
		New Mills & Hayfield £2115			
		Newport, M. £11720		8 0 0	
380	50	*Newport, Isle of W.*	38 0 0	4 0 0	19 to 20
		Newport Pagnell			
		Newport, Salop			
		Newton Abbot			
		Newton, Lanc.			
		Northallerton			
		North Walsham			
542	20	*Northampton*	18 0 0	10 0 0	27 0 0
		Northwich			
		Norwich (see British Pro. £40,000		7 0 0	
900	50	*Nottingham*	50 0 0	10 0 0	
900	50	New shares		10 0 0	
		Nuneaton			
		Oakham			
		Oakhampton			
200	10	Odiham, Hants	10 0 0	3 10 0	10 0 0
		Oldham			
		Olney			
		Ongar			
		Ormskirk			
		Otley, Yorkshire			
		Oundle			
		Oxford £18,000		9 10 0	
		Over Darwen £8000		5 0 0	
		Padstow			
		Pately Bridge, Yrk.			
250	20	Penrith	15 0 0	6 10 0	21 0 0
		Penryn			
		Penzance			
200	10	Petworth	10 0 0	8 0 0	12 0 0
		Petersfield			
		Pickering			
300	10	*Plymouth*	10 0 0	6 0 0	11 0 0
		Pocklington			
		Pontefract			
		Pontypridd			
400	10	Poole	10 0 0	5 0 0	10 0 0
		Port Madoc			
600	50	*Portsea Island*	53 0 0	5 0 0	45 to 47
400	10	Prescott	9 0 0	4 13 4	7 0 0
		Preston £52,500		10 0 0	
		Pwllhelli			
		Pudsey £12,000		5 0 0	
		Radcliff and Pilkington £9000		4 12 10	
		Ramsay, I. of Man			
		Ramsgate (see Isle of Thanet)			
		Ravenglass			
1000	10	*Reading*	10 0 0	3 0 0	7 0 0
500	20	*Reading Union*	20 0 0	6 0 0	17 0 0
		Redditch			
		Redruth			
		Reigate			
		Retford (East)			
		Rhyl			
		Richmond (Surrey)			
		Ripon			
		Rochester and Chatham £20,000		6 0 0	
		Rochford			
		Rockingham			
		Romford			
		Ross			
245	25	*Rotherham*	25 0 0	6 0 0	40 10 0
		Royston			
		Ruabon			
		Rugby			
		Rugeley			
		Runcorn £11,000		7 10 0	
		Ruthin			
500	10	Ryde	10 0 0	6 0 0	12 0 0
		Rye			
		Romsey			
		Saddleworth			
225	20	Saffron Walden	20 0 0	3 15 0	19 0 0
		St. Austel			
		St. Asaph			
		St. Colomb			
		St. Helen's £7500		7 10 0	
		St.Helier's(Jersey)			
		St. Ives, Hunting.			
		St. Ives, Cornwall			
250	10	St. Neot's	10 0 0	8 0 0	12 0 0
		St. Peter's Port, (Guernsey)			
320	25	Salisbury	25 0 0	6 0 0	28 to 30
		Sandbach			
140	10	Saxmundham	10 0 0	5 0 0	10 0 0
		Scarborough			
		Seaham Harbour			
		Selby			
		Settle			
290	10	Sevenoaks	10 0 0	5 0 0	10 0 0
5400	25	*Sheffield United*	24 0 0	8 6 8	35 0 0
		Shelton, Potteries (see Brit. Prov.)			
		Shepton Mallet			
		Sherborne			
2914	5	Shields, North (Tynemouth)	5 0 0	3 0 0	5 0 0
		Shields (South)			
		Shiffnal, Salop			
1000	5	*Shipley*	5 0 0	6 0 0	5 12 6
		Shipston-on-Stour			
		Shoreham			
		Shrewsbury £10,000		7 0 0	
400	10	Skipton	10 0 0	4 0 0	11 0 0
		Sleaford			
250	10	Slough	10 0 0		
		Snaith			
		Soham			
		Southwold			
		South Molton			
1000	50	*Southampton*	32 0 0	5 0 0	
		Sowerby, Yorksh.			
		Stretford			
		Stokesly			
		Stafford £10,000		5 0 0	
		Staines and Egham			
		Staley Bridge £15,000		10 0 0	
		Stamford £11,250		3 0 0	
		Stockton-on-Tees £7980		9 5 0	
840	9½	Stockton, New	9 10 0	9 0 0	8 0 0
960	10	Stoke-upon-Trent	10 0 0	5 10 0	10 0 0
500	10	„ new shares	4 0 0	5 10 0	10 0 0
		Stone, Stafford			
		Stoney Stratford			
		Stourbridge			
		Stowmarket			
150	20	Stratford-on-Avon	20 0 0	7 10 0	30 0 0
		Stroud			
169	10	Swaffham	10 0 0	5 0 0	5 10 0
		Swansea £9000			
		Sudbury			
		Sunderland, old			
6400	5	*Sunderland*, new	5 0 0		
		Sutton			
		Swindon			
2800	5	*Taunton*	5 0 0	None	2 10 0
		Tadcaster			
		Tamworth			
		Tavistock			
		Teignmouth			
		Tenbury			
		Tenby			
		Tenterden £2000		2 10 0	
		Tetbury, Gloster			
		Tewkesbury			
		Thame			
		Thetford			
		Thirsk			
		Thornbury			
		Thorne			
		Tiverton			
670	5	Todmorden	3 0 6		
		Torquay			
		Torrington, Devon			
		Totnes			
		Totnes and Bridgetown Consumers			
4000	5	Tottenham	3 10 0	6 0 0	3 0 0
		Towcester			
		Tring			
		Trowbridge (see British Provin.)			
75	50	Truro	50 0 0	2 0 0	
		Tunbridge			
		Tunbridge Wells			
		Ulverston			
		Uppingham			
240	5	Upton-on-Severn	5 0 0	5 0 0	5 0 0
		Usk, Monmouth			
		Uttoxeter			
		Uxbridge			
1000	25	*Wakefield*, old capl	25 0 0	6 0 0	25 0 0
1600	5	„ new „	5 0 0	6 0 0	5 0 0
300	10	Wallingford	10 0 0	5 0 0	8 0 0
		Wandsworth			
		Wantage			
		Warrington £23304		10 0 0	
100	10	Wareham	10 0 0	3 10 0	8 0 0
120	25	Warminster	25 0 0	5 0 0	27 0 0
		Warth			
		Warwick £15,000		6 0 0	
		Watford			
		Welchpool, Mntgy.			
		Wellingborough			
		Wellington, Salop			
		Wellington, Smrst.			
		Wells, Smrst. £5000		7 10 0	
		Westbury			
		Weston-sup.-Mare			
2000	5	West Ham	5 0 0	6 0 0	5 0 0
		Whitby			
		Whitehaven			
		Whitstable			
		Whittlesea			
		Wigan £10,160		12 10 0	
		Willenhall			
		Winchelsea			
		Winslow			
240	10	Wimborne Minster	10 0 0		
		Wincanton			
360	50	Winchester	50 0 0	6 0 0	
900	12½	Windsor	12 10 0	10 0 0	23 0 0
		Witham			
		Witney			
4448	10	*Wolverhampton*	10 0 0	7 0 0	15 0 0
		Woburn			
210	10	Wokingham	10 0 0		10 0 0
		Woodbridge			
		Wooler			
		Wotton-un.-Edge			
		Worcester £29,000		8 0 0	
		Workington			
		Worksop and Radford			
		Wirksworth			
		Worthing			
		Wrexham			
		Woolwich			
		Woolwich Consms.			
		Woolwich (North)			
		Wymondham			
		Yarm			
795	20	Yarmouth	20 0 0		15½ to 16½
		Yeadon, near Leeds			
		Yeovil			
		York Untd. £35,000		7 0 0	
		SCOTLAND.			
		Aberdeen			
		Airdrie			
		Alloa			
		Annan			
		Anstruther			
		Ardrossan			
550	20	Arbroath	20 0 0	7 10 0	7 10 0
		Auchterarder			
750	2	Auchtermuchty	2 0 0	6 0 0	2 10 0
		Ayr, old			
		Ditto, new			
		Banff			
		Barrhead			
		Bathgate			
		Beith			
		Bervie			
		Biggar			
		Blairgowrie			
350	6	Borrowstowness	6 0 0	5 0 0	8 0 0
		Brechin			
		Bridge of Allan			
		Broughty Ferry			
		Burntisland			
		Callen			
		Campbelton			
		Clackmannan			
		Coatbridge			
		Coldstream			
		Collinsburgh			
		Crieff			
		Crail, Fife			
		Cumbernauld			
		Cumnock			
600	5	Cupar Angus	5 0 0	6 0 0	5 10 0
250	10	Cupar Fife	10 0 0	7 10 0	14 0 0
		Dalkeith			
		Dingwall			
		Dornoch			
		Douglas			
		Dumbarton			
400	20	Dumfries	14 0 0	5 0 0	20 0 0
		Dunbar			
		Dunblane			
		Dundee, old £29,687		4 4 0	

Number of Shares issued.	Amount per Share	Name of Company.	Amount paid up per Share	Dividend per Cent. per Ann.	Price.
	£		£ s. d	£ s. d	£ s. d
		Dundee, nw £33,851		2 10 0	
860	10	Dunfermline	10 0 0	6 0 0	12 12 0
		Dunkeld			
		Dunse			
		Dysart			
6000	25	*Edinburgh Gas Co.*	25 0 0	10 0 0	45 0 0
		„ *and Leith Co.*			
		£98,640		6 10 0	
		Elie			
		Elgin			
		Falkirk, old			
		„ new			
		Falkland			
		Ferry Port on Craig			
		Fochabers			
		Forfar			
		Fort William			
		Fraserburgh			
		Galashiels			
		Garlieston			
		Gatehouse n. Fleet			
		Girvan			
		Glasgow £122,500		7 10 0	
15000	10	*Glasgow City and Suburban*	9 0 0	6 10 0	9 0 0
		Grangemouth			
		Grahamston			
		Haddington			
		Hamilton £7500		8 0 0	
		Hawick			
		Helensburgh			
		Huntly			
		Inverary			
400	1	Inverkeithing	1 0 0	5 0 0	1 0 0
1200	10	*Inverness Gas and Water*	10 0 0	5 10 0	15 0 0
2400	5	„ new shares	1 5 0	5 10 0	2 5 0
		Irvine			
		Jedburgh			
		Johnstone, near Paisley			
		Keith			
		Kelso			
		Kilmarnock			
		Kincardine			
		Kinghorn			
		Kingskittlo, Fife			
		Kinross			
		Kirkaldy			
320	5	Kirkcudbright	3 0 0	5 0 0	5 0 0
1000	3	Kirkintulloch, near Glasgow	3 0 0	5 0 0	3 0 0
227	5	Kirkwall	5 0 0	5 0 0	4 10 0
518	5	Kirriemuir	5 0 0	6 0 0	
		Lanark			
		Largo, near Leven			
		Largs			
		Lasswade, n. Edin.			
		Lauder			
		Leith			
		Leslie, Fife			
		Lesmahago			
		Leven			
		Linlithgow			
		Linton, n. Nobleh.			
		Lochee, n. Dundee			
		Lochgilphead			
		Lochwinnock, near Paisley			
1200	1	Markinch	1 0 0	7 10 0	1 5 0
		Mauchline			
		Maxwell-town, n. Dumfries			
		Maybole, Ayrshire			
		Maryhill, near Glasgow			
		Melrose			
718	2	Mid & East Calder	2 0 0		2 0 0
192	5	Moffat	5 0 0		
13½		Montrose	13 10 0	7 11 1	
		Musselburgh			
		Nairn			
		Neilston, n. Glasg.			
		Newmills, near Kilmarnock			
		Newburgh, Fife			
		Newton Stewart			
		North Berwick, n. Haddington			
		North Queensferry			
		Oban			
		Peebles			
800	25	Perth	25 0 0	4 16 0	22 10 0
		Peterhead			
		Pittenweem			
		Pollokshaws, near Glasgow			
		Port Glasgow			
		Portobello, near Edinburgh			
		Prestonpans			
		Rutherglen, near Glasgow			
		Renfrew, n. Paisley			
		Saltcoats			
		Sanquhar			
		Selkirk			
		South Queensferry			
		St. Andrew's			
		Stewarton			
		Stirling			
		Stoneheavn			
		Stonhouse, Lanrks.			
		Stornoway			
		Stranraer			
		Strathaven, near Hamilton			
		Thurso			
		Tillicoultry, n. Alloa			
800	1	Tranent	1 0 0		1 0 0
		Troon			
		Wick			
		Wigton			
		Wemyss	4 10 0		

IRELAND.

Number of Shares issued.	Amount per Share	Name of Company.	Amount paid up per Share	Dividend per Cent. per Ann.	Price.
	£		£ s. d	£ s. d	£ s. d
300	10	Armagh	10 0 0	8 0 0	14 10 0
		Ballinasloe			
700	50	*Belfast*	50 0 0		
		Ballymena			
		Ballymoney			
		Carrickfergus			
		Carlow, new			
		Cork (see Un. Gen.)			
		Clonmel Consumrs			
		Drogheda			
19,000	10	*Dublin Consumers*	5 0 0	7 0 0	6 0 0
		Dublin Hibernian (see United Gen.)			
160	25	Dundalk	25 0 0		22 0 0
		Dungannon			
1000	5	*Downpatrick*	5 0 0		
		Enniskillen			
		Galway			
400	10	Kilkenny	10 0 0	8 0 0	11 5 0
		Larne			
		Limerick (see U.G.)			
1725	5	Limerick Consum.	5 0 0	5 0 0	5 0 0
600	15	Londonderry	15 0 0	6 13 4	21 10 0
500	7	Lisburn	7 0 0	6 5 0	7 0 0
520	10	Lurgan	6 0 0	6 0 0	6 0 0
		Mallow			
		Monaghan			
		Nenagh			
448	5	Newtownards	5 0 0	4 0 0	5 0 0
		New Ross			
		Newry			
		Omagh			
125	20	Portadown	20 0 0	6 0 0	20 0 0
600	10	Sligo	10 0 0		
		Tipperary			
		Tralee			
		Waterford			
		Wexford			

The Gas Works in the undermentioned towns belong to private individuals:—

Abergavenny.	Ely.	Hertford.	Morpeth.	Sheerness.	Ware. (2 works)
Bridgenorth.	Farsley.	Holt.	Oswestry.	Sidmouth.	Wem.
Carlow, old.	Gainsborough.	Huntingdon.	Peterborough.	Sittingbourne.	Weymouth.
Carnarvon.	Goole.	Hyde (Cheshire)	Pontypool.	Spalding.	Whitchurch (Salop).
Deal.	Harleston.	Kingston-on-Thames.	St. Alban's.	Waltham Abbey.	Wisbeach.
Diss.	Hatfield.	Lynn.	Sandwich.		

The Gas Works belong to the Corporations, or to Commissioners acting under special acts of Parliament, in the following towns:—

Carlisle.	Keighly.	Milton (Kent).	Rothesay.	Southport (Lanc.)	Walsall.
Cashel.	Knaresborough.	Paisley.	Richmond (Yorkshire).	Stockport	Wells (Norfolk).
Coleraine.	Lytham (Lanc.)	Rochdale.	Salford.	Strabane.	Youghall.
Greenock.	Manchester.				

Price Current.

The following List of Prices is corrected by an eminent wholesale house in each trade up to the latest period:—

CASTINGS, per Ton.

Average Weight of Cast Iron Pipes, per Yard.

1½ in.	2 in.	2½ in.	3 in.	4 in.	5 in.	6 in.	7 in.	8 in.	9 in.	10 in.	12 in.
16	21	28	33	51	70	89	107	126	149	177	208 lbs.

Retail Prices are 5 to 10 per cent. higher.	London.	Glasgow	Newcastle.	Wales.	Yorksh., Derbysh., and Staffrdsh.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Pig Iron, No. 1	3 7 6	2 10 0	3 0 0	3 15 0	3 10 0
1½ and 2 inches Socket Pipes	6 0 0	5 0 0	5 10 0	5 15 0	5 15 0
2½ and 3 do. do.	5 17 6	4 17 6	5 7 6	5 12 6	5 12 6
4 and 5 do. do.	5 15 0	4 15 0	5 5 0	5 10 0	5 10 0
6 inches and upwards do.	5 12 6	4 15 0	5 2 6	5 7 6	5 7 6
Extra for bends, branches, and connection	2 0 0	2 0 0	2 0 0	2 0 0	2 0 0
Retorts, 1st fusion	5 5 0	..	..	4 17 6	5 0 0
Do. 2nd fusion	5 15 0	4 10 0	4 17 6	5 5 0	5 5 0
Tank Plates, ¼ thick and above	5 10 0	4 17 6	5 0 0	5 7 6	5 17 6
Do. less than ¼	5 15 0	5 0 0	5 0 0	..	5 10 0
Plain Castings ex. models	5 15 0	5 0 0	5 0 0	5 10 0	5 10 0

COALS.

NEWCASTLE. Unscreened.	s.	d.	
Ravensworth Pelaw, Dean's Primrose, Pelton	5	9	„
Brancepeth, Medomsley, New Tanfield, Pelaw	6	0	„
	6	3	„
Eighton Moor, Felling Main, New Pelton, Peareth, South Pelaw, Waldridge, Washington Hatton, South Peareth	6	6	„
Ramsay's Cannel	12	0	„
Cowen's Cannel	12	0	„

DERBYSHIRE. Unscreened.	s.	d.	
Clay Cross, Deep Main, New Birchwood	6	6	per ton.

SCOTCH CANNEL.			
Kirkness	best	23	0 „
Boghead		21	0 „
Capeldrae, first quality		20	0 „
Ditto, second quality		10	0 „
Lothian		18	0 „
Lesmahago at Glasgow		16	6 „
Ditto at Leith		18	0 „
Wemyss		15	0 „
Donibristle		10	6 „
Bridgeness, Kinneil		11	0 „
Lochgelly, Lumphinan		9	6 „

FIRE GOODS.

Best Bricks, 50s. per 1000, at Newcastle.
Do. Clay, 12s. per ton do.

LEAD.

Soft pig, £18. 10s. per ton.

WROUGHT IRON TUBING, subject to 40 per cent. Discount.

	2 inches.	1½ inch.	1¼ inch.	1 inch.	¾ inch.	½ inch.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Patent welded tubes, from 4 to 12 feet, per foot	1 8	1 0	0 10	0 7	0 5	0 4½
Ditto „ 2 to 4 feet	.....One	penny	per foot	extra.		
Ditto „ 6 in. to 18 in., each	3 0	2 0	1 9	1 3	1 0	0 9
Connecting pieces, or long screws	3 6	2 3	2 0	1 6	1 2	0 11
Bends, springs, and elbows, wrought iron	3 9	2 3	1 9	1 0	0 10	0 8
Tees, wrought or cast	4 0	2 6	2 0	1 6	1 1	0 10
Crosses, wrought or cast	4 6	3 0	2 6	2 0	1 6	1 2
Iron cocks	17 6	9 6	7 6	4 6	3 3	2 6
Ditto, with brass plug	28 0	16 0	13 0	7 0	5 6	4 6
Diminishing sockets, caps, plugs, and nipples	1 3	0 9	0 8	0 6	0 5	0 4
Plain sockets	1 0	0 8	0 7	0 5	0 4	0 3
Flanches	1 9	1 6	1 3	1 0	0 9	
Syphons, 2 quart	15 0	14 0	13 6	13 0	12 0	

FREIGHTS, per Ton.

Coastwise—Newcastle.	s.	d.
Chatham & Roches.	5	9
Cork	8	6
Dover	5	9
Dublin	9	0
Exeter Quay	8	0
Folkestone	6	0
Hastings	7	6
Ipswich	5	3
Jersey	7	0
London	5	3
Lowestoft	4	6
Lynn	5	9
Margate	6	0
Portsmouth	7	0
Plymouth	7	3
Southampton	7	0
Weymouth	7	3
Yarmouth	4	9
Foreign.		
Amsterdam	8	0
Boulogne	6	9
Barcelona	17	6
Bordeaux	10	9
Calais	6	9
Dieppe	7	3
Hamburg	7	0
Havre	8	3
Lisbon	10	6
Rotterdam	7	3
Rouen	10	6
St. Petersburgh	9	6
Stettin	8	6
Trieste and Venice	21	0